Commonwealth of Australia

EDICT OF GOVERNMENT

In order to promote public education and public safety, equal justice for all, a better informed citizenry, the rule of law, world trade and world peace, this legal document is hereby made available on a noncommercial basis, as it is the right of all humans to know and speak the laws that govern them.

AS NCC 1 (2012) (English): National Construction Code, Volume 1: Building Code of Australia, Class 2 to Class 9 Buildings [Authority: As Required by All States and Territory Governments]

"We will sell to no man, and we will not deny or defer to any man, either justice or right."
Parliamentary Counsel
Australian Capital Territory

"The content of the law should be accessible to the public."
Honourable Murray Gleeson, AC, QC
11th Chief Justice of the High Court

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National Construction Code Series 2012

VOLUME ONE

Building Code of Australia Class 2 to Class 9 Buildings

2012

ABCB

CONTENTS AND FEATURES INTRODUCTION

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Introduction

Australian Building Codes Board
GPO Box 9839 Canberra ACT 2601
Telephone: Canberra 1300 134 631 *Facsimile*: (02) 6213 7287
Web Site: http://www.abcb.gov.au
Email: ncc@abcb.gov.au

The Australian Building Codes Board (ABCB) is established by agreement between the Commonwealth Government and each State and Territory Government. It is a co-operative arrangement between the signatories, local government and the building industry.

ABCB Important Disclaimer
The ABCB gives no warranty or guarantee that Volume One of the BCA is correct or complete. The ABCB shall not be liable for any loss howsoever caused whether due to negligence or otherwise arising from the use of or reliance on Volume One of the BCA.

The ABCB recommends that anyone seeking to rely on Volume One of the BCA obtain their own independant expert advice in relation to building or retalted activities. Its interpretation in no way overrides the approvals processes in any jurisdiction.

NCC Customer Support
Telephone (Australia Only): 1300 134 631
International: +61 2 6213 7842
Facsimile: +61 2 6290 8831
Email: ncc@abcb.gov.au

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GENERAL TABLE OF CONTENTS

INTRODUCTION

THE NATIONAL CONSTRUCTION CODE SERIES

The National Construction Code Series (NCC) is an initiative of the Council of Australian Governments developed to incorporate all on-site construction requirements into a single code. The Building Code of Australia (BCA) is Volume One and Volume Two of the NCC.

FORMAT

The NCC is published in three volumes:

VOLUME ONE:

pertains primarily to Class 2 to 9 buildings.

VOLUME TWO:

pertains primarily to Class 1 and 10 buildings (houses, sheds, carports, etc).

VOLUME THREE:

pertains primarily to plumbing and drainage associated with all classes of buildings.

All three volumes are drafted in a performance format allowing a choice of *Deemed-to-Satisfy Provisions* or flexibility to develop *Alternative Solutions* based on existing or new innovative building, plumbing and drainage products, systems and designs.

THE BUILDING CODE OF AUSTRALIA

The Building Code of Australia (BCA) is produced and maintained by the Australian Building Codes Board (ABCB) on behalf of the Australian Government and each State and Territory government.

The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia whilst allowing for variations in climate and geological or geographic conditions.

THE AUSTRALIAN BUILDING CODES BOARD

The ABCB is established by agreement between the Australian Government and each State and Territory Government. It is a co-operative arrangement between the signatories, local government and the building industry.

The ABCB's mission is to address issues relating to safety, health, amenity and sustainability in the design, construction and performance of buildings. This is achieved through the NCC and the development of effective regulatory systems and appropriate non-regulatory solutions.

The Board comprises—

(a) a Chair; and

(b) the head of each Commonwealth, State and Territory department, statutory body, division, or agency that has the relevant administrative responsibility for NCC matters; and

(c) a representative of the Australian Local Government Association (ALGA); and

(d) representatives of the building and construction industry, including one representative with plumbing expertise.

The Building Codes Committee (BCC) is the peak technical advisory body to the ABCB, with responsibility for technical matters associated with the BCA.

The BCC comprises—

(a) the General Manager of the ABCB; and

(b) one nominee each of the Australian, State, and Territory Governments and ALGA members of the ABCB; and

(c) representatives of the building and construction industry.

THE BCA — CONTENT

GOALS

The goal of the BCA is to enable the achievement of nationally consistent, minimum necessary standards of relevant safety (including structural safety and safety from fire), health, amenity and sustainability objectives efficiently.

This goal is applied so that—

(a) there is a rigorously tested rationale for the regulation; and

(b) the regulation is effective and proportional to the issues being addressed such that the regulation will generate benefits to society greater than the costs (that is, net benefits); and

(c) there is no regulatory or non-regulatory alternative (whether under the responsibility of the Board or not) that would generate higher net benefits; and

(d) the competitive effects of the regulation have been considered and the regulation is no more restrictive than necessary in the public interest.

STATE AND TERRITORY VARIATIONS AND ADDITIONS

Each State's and Territory's legislation adopts the BCA subject to the variation or deletion of some of its provisions, or the addition of extra provisions. These variations, deletions and additions are contained in Appendices to the BCA.

Flags identifying variations are located within relevant provisions and at the beginning of relevant Tables. Additional provisions to a Part of the BCA are identified at the end of that Part.

DEFINITIONS

Words with special meanings are printed in italics and are defined in **A1.1**.

LEGISLATIVE ARRANGEMENTS

GENERAL

The BCA is given legal effect by building regulatory legislation in each State and Territory. This legislation consists of an Act of Parliament and subordinate legislation which empowers the regulation of certain aspects of buildings and structures, and contains the administrative provisions necessary to give effect to the legislation.

Any provision of the BCA may be overridden by, or subject to, State or Territory legislation. The BCA must therefore be read in conjunction with that legislation. Any queries on such matters should be referred to the State or Territory authority responsible for building regulatory matters.

BCA ADOPTION

The adoption of the BCA is addressed in **Part A0** of Volume One.

DOCUMENTATION OF DECISIONS

Decisions made under the BCA should be fully documented and copies of all relevant documentation should be retained.

Examples of the kind of documentation which should be prepared and retained include:

(a) Details of the *Building Solution* including all relevant plans and other supporting documentation.

(b) In cases where an *Alternative Solution* has been proposed—

  (i) details of the relevant *Performance Requirements*; and

  (ii) the *Assessment Method* or methods used to establish compliance with the relevant *Performance Requirements*; and

  (iii) details of any *Expert Judgement* relied upon including the extent to which the judgement was relied upon and the qualifications and experience of the expert; and

  (iv) details of any tests or calculations used to determine compliance with the relevant *Performance Requirements*; and

  (v) details of any Standards or other information which were relied upon.

STRUCTURE

The BCA has been structured as set out in **A0.3** and shown in **Figure A0.3**. It is the ABCB's intent that the *Objectives* and *Functional Statements* be used as an aid to the interpretation of the BCA and not for determining compliance with the BCA.

FURTHER DEVELOPMENT OF THE BCA

Regular changes are planned to the BCA to improve clarity of provisions, upgrade referenced documents and to reflect the results of research and improved technology.

SECTION A

GENERAL PROVISIONS

SECTION A CONTENTS

Specifications

Specification A1.3 Documents Adopted By Reference
Specification A2.3 Fire-Resistance of Building Elements
Specification A2.4 Fire Hazard Properties

PART A0 APPLICATION

A0.1 Adoption

The dates of adoption of the Building Code of Australia (Volume One) are shown in the "History of BCA Adoption" division at the end of this Volume.

A0.2 BCA Volumes

(a) The Building Code of Australia consists of two volumes, Volume One and Volume Two.

(b) This is Volume One of the Building Code of Australia which contains the requirements for—

  (i) all Class 2 to 9 buildings; and

  (ii) access requirements for people with a disability in Class 1b and 10a buildings; and

  (iii) certain Class 10b structures including access requirements for people with a disability in Class 10b *swimming pools*.

(c) Volume Two contains the requirements for—

  (i) Class 1 and 10a buildings (other than access requirements for people with a disability in Class 1b and 10a buildings); and

  (ii) certain Class 10b structures (other than access requirements for people with a disability in Class 10b *swimming pools*); and

  (iii) Class 10c *private bushfire shelters*.

A0.3 BCA Structure

The structure of the BCA comprises the following as shown in **Figure A0.3**:

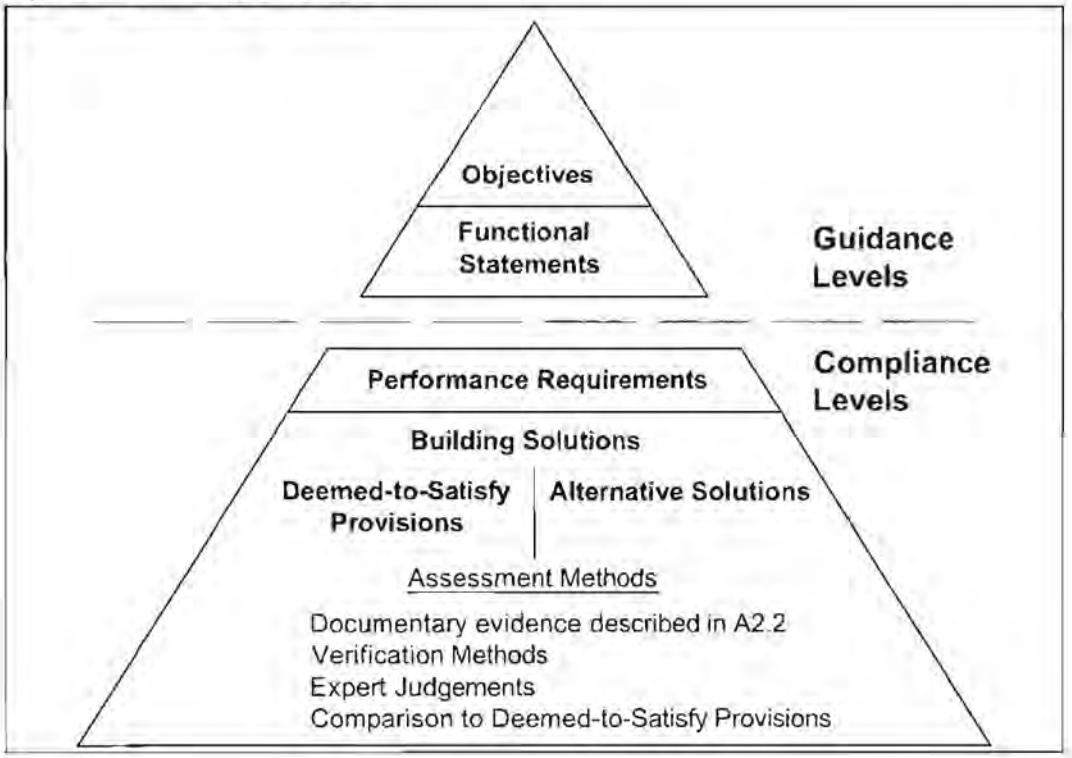
(a) The *Objectives*.

(b) The *Functional Statements*.

(c) The *Performance Requirements* with which all *Building Solutions* must comply.

(d) The *Building Solutions*.

Figure A0.3 — BCA Structure



A0.4 Compliance with the BCA

A *Building Solution* will comply with the BCA if it satisfies the *Performance Requirements*.

A0.5 Meeting the Performance Requirements

Compliance with the *Performance Requirements* can only be achieved by—

(a) complying with the *Deemed-to-Satisfy Provisions*; or

(b) formulating an *Alternative Solution* which—

  (i) complies with the *Performance Requirements*; or

  (ii) is shown to be at least *equivalent* to the *Deemed-to-Satisfy Provisions*; or

(c) a combination of **(a)** and **(b)**.

A0.6 Objectives and Functional Statements

The *Objectives* and *Functional Statements* may be used as an aid to interpretation.

A0.7 Deemed-to-Satisfy Provisions

A *Building Solution* which complies with the *Deemed-to-Satisfy Provisions* is deemed to comply with the *Performance Requirements*.

A0.8 Alternative Solutions

(a) An *Alternative Solution* must be assessed according to one or more of the *Assessment Methods*.

(b) An *Alternative Solution* will only comply with the BCA if the *Assessment Methods* used to determine compliance with the *Performance Requirements* have been satisfied.

(c) The *Performance Requirements* relevant to an *Alternative Solution* must be determined in accordance with **A0.10**.

A0.9 Assessment Methods

The following *Assessment Methods*, or any combination of them, can be used to determine that a *Building Solution* complies with the *Performance Requirements*:

(a) Evidence to support that the use of a material, form of construction or design meets a *Performance Requirement* or a *Deemed-to-Satisfy Provision* as described in **A2.2**.

(b) *Verification Methods* such as—

  (i) the *Verification Methods* in the BCA; or

  (ii) such other *Verification Methods* as the appropriate authority accepts for determining compliance with the *Performance Requirements*.

(c) Comparison with the *Deemed-to-Satisfy Provisions*.

(d) *Expert Judgement*.

A0.10 Relevant Performance Requirements

In order to comply with the provisions of **A1.5** (to comply with Sections A to J inclusive) the following method must be used to determine the *Performance Requirement* or *Performance Requirements* relevant to the *Alternative Solution*:

(a) Identify the relevant *Deemed-to-Satisfy Provision* of each Section or Part that is to be the subject of the *Alternative Solution*.

(b) Identify the *Performance Requirements* from the same Sections or Parts that are relevant to the identified *Deemed-to-Satisfy Provisions*.

(c) Identify *Performance Requirements* from other Sections and Parts that are relevant to any aspects of the *Alternative Solution* proposed or that are affected by the application of the *Deemed-to-Satisfy Provisions*, that are the subject of the *Alternative Solution*.

PART A1 INTERPRETATION

A1.1 Definitions

Note: States and Territories may vary or add to the definitions contained in **A1.1** at the relevant State or Territory Appendix.

In Volume One of the BCA unless the contrary intention appears—

Accessible means having features to enable use by people with a disability.

Accessway means a continuous *accessible* path of travel (as defined in AS 1428.1) to, into or within a building.

Aged care building means a Class 9c building for residential accommodation of aged persons who, due to varying degrees of incapacity associated with the ageing process, are provided with *personal care services* and 24 hour staff assistance to evacuate the building during an emergency.

Air-conditioning, for the purposes of **Section J**, means a *service* that actively cools or heats the air within a space, but does not include a *service* that directly cools or heats cold rooms, hot rooms or Class 8 *electricity network substations*.

Alpine area means land—

(a) likely to be subject to significant snowfalls; and

(b) in New South Wales, A.C.T. or Victoria more than 1200 m above the Australian Height Datum; and

(c) in Tasmania more than 900 m above the Australian Height Datum.

Alteration, in relation to a building, includes an addition or extension to a building.

Alternative Solution means a *Building Solution* which complies with the *Performance Requirements* other than by reason of satisfying the *Deemed-to-Satisfy Provisions*.

Annual energy consumption means the theoretical amount of energy used annually by the building's *services*, excluding kitchen exhaust and the like.

(NSW, Assembly building)

Assembly building means a building where people may assemble for—

(a) civic, theatrical, social, political or religious purposes including a library, theatre, public hall or place of worship; or

(b) educational purposes in a *school*, *early childhood centre*, preschool, or the like; or

(c) entertainment, recreational or sporting purposes including—

(i) a discotheque, nightclub or a bar area of a hotel or motel providing live entertainment or containing a dance floor; or

(ii) a cinema; or

(iii) a sports stadium, sporting or other club; or

(d) transit purposes including a bus station, railway station, airport or ferry terminal.

A GENERAL PROVISIONS

Assessment Method means a method used for determining that a *Building Solution* complies with the *Performance Requirements*.

Atrium means a space within a building that connects 2 or more *storeys*, and—

(a) is wholly or substantially enclosed at the top by a floor or roof (including a glazed roof structure); and

(b) includes any adjacent part of the building not separated by an appropriate barrier to fire; but

(c) does not include a stairwell, rampwell or the space within a *shaft*.

Atrium well means a space in an *atrium* bounded by the perimeter of the openings in the floors or by the perimeter of the floors and the *external walls*.

Automatic means designed to operate when activated by a heat, smoke or fire sensing device.

Average recurrence interval, applied to rainfall, means the expected or average interval between exceedances of a given intensity.

Average specific extinction area means the average specific extinction area for smoke as determined by AS/NZS 3837.

Backstage means a space associated with, and adjacent to, a *stage* in a Class 9b building for scenery, props, equipment, dressing rooms, or the like.

Building Solution means a solution which complies with the *Performance Requirements* and is—

(a) an *Alternative Solution*; or

(b) a solution which complies with the *Deemed-to-Satisfy Provisions*; or

(c) a combination of **(a)** and **(b)**.

Carpark means a building that is used for the parking of motor vehicles but is neither a *private garage* nor used for the servicing of vehicles, other than washing, cleaning or polishing.

Certificate of Accreditation means a certificate issued by a State or Territory accreditation authority stating that the properties and performance of a building material or method of construction or design fulfill specific requirements of the BCA.

Certificate of Conformity means a certificate issued under the ABCB scheme for products and systems certification stating that the properties and performance of a building material or method of construction or design fulfill specific requirements of the BCA.

Climate Zone means an area defined in **Figure A1.1** and in **Table A1.1** for specific locations, having energy efficiency provisions based on a range of similar climatic characteristics.

Figure A1.1 — CLIMATE ZONES FOR THERMAL DESIGN

Notes:

1. This map can be viewed in enlargeable form on the Energy Efficiency page of the ABCB web site at www.abcb.gov.au.
2. A Zone 4 area in South Australia, other than a council area, at an altitude greater than 300 m above the Australian Height Datum is to be considered as Zone 5.

   These areas have been defined in an enlarged format on the following maps produced by the Department of Planning, Transport and Infrastructure:

   Adelaide Hills Council Climate Zone Map

   Barossa Council Climate Zone Map

   Regional Council of Goyder Climate Zone Map

   These maps can be viewed on the Government of South Australia website at www.sa.gov.au
3. Locations in *climate zone* 8 are in *alpine areas*.

Table A1.1 CLIMATE ZONES FOR THERMAL DESIGN - VARIOUS LOCATIONS

Location	*Climate zone*	Location	*Climate zone*	Location	*Climate zone*	Location	*Climate zone*
Australian Capital Territory				Canberra	7		
New South Wales							
Albury	4	Byron Bay	2	Lord Howe Island	2	Sydney West	6
Armidale	7	Cobar	4	Moree	4	Tamworth	4
Batemans Bay	6	Coffs Harbour	2	Newcastle	5	Thredbo	8
Bathurst	7	Dubbo	4	Nowra	6	Wagga Wagga	4
Bega	6	Goulburn	7	Orange	7	Williamtown	5
Bellingen Shire - Dorrigo Plateau	7	Grafton	2	Perisher Smiggins	8	Wollongong	5
Bellingen Shire - Valley & seaboard	2	Griffith	4	Port Macquarie	5	Yass	6
Bourke	4	Ivanhoe	4	Sydney East	5		
Broken Hill	4	Lismore	2				
Northern Territory							
Alice Springs	3	Elliot	3	Renner Springs	3		
Darwin	1	Katherine	1	Tennant Creek	3		
Queensland							
Birdsville	3	Cunnamulla	3	Maryborough	2	Toowoomba	5
Brisbane	2	Longreach	3	Mount Isa	3	Torrens Creek	3
Bundaberg	2	Gladstone	2	Normanton	1	Townsville	1
Cairns	1	Labrador	2	Rockhampton	2	Warwick	5
Cooktown	1	Mackay	2	Roma	3	Weipa	1
South Australia							
Adelaide	5	Kingscote	6	Marree	4	Port Lincoln	5
Bordertown	6	Leigh Creek	5	Mount Gambier	6	Renmark	5
Ceduna	5	Lobethal	6	Murray Bridge	6	Tarcoola	4
Cook	4	Loxton	5	Oodnadatta	4	Victor Harbour	6
Elliston	5	Naracoorte	6	Port Augusta	4	Whyalla	4

Table A1.1 CLIMATE ZONES FOR THERMAL DESIGN - VARIOUS LOCATIONS (Continued)

Location	*Climate zone*	Location	*Climate zone*	Location	*Climate zone*	Location	*Climate zone*
Tasmania							
Burnie	7	Flinders Island	7	Launceston	7	Rossarden	7
Bicheno	7	Hobart	7	New Norfolk	7	Smithton	7
Deloraine	7	Huonville	7	Oaklands	7	St Marys	7
Devonport	7	King Island	7	Orford	7	Zeehan	7
Victoria							
Anglesea	6	Bright	7	Horsham	6	Swan Hill	4
Ararat	7	Colac	6	Melbourne	6	Traralgon	6
Bairnsdale	6	Dandenong	6	Mildura	4	Wangaratta	7
Ballarat	7	Echuca	4	Portland	6	Warrnambool	6
Benalla	6	Geelong	6	Sale	6	Wodonga	6
Bendigo	6	Hamilton	7	Shepparton	4		
Western Australia							
Albany	6	Cocos Island	1	Kalgoorlie-Boulder	4	Port Hedland	1
Balladonia	4	Derby	1	Karratha	1	Wagin	4
Broome	1	Esperance	5	Meekatharra	4	Wyndham	1
Bunbury	5	Exmouth	1	Northam	4		
Carnarvon	3	Geraldton	5	Pemberton	6		
Christmas Island	1	Halls Creek	3	Perth	5		

Combustible means—

(a) Applied to a material — *combustible* as determined by AS 1530.1.

(b) Applied to construction or part of a building — constructed wholly or in part of *combustible* materials.

Common wall means a wall that is common to adjoining buildings.

Conditioned space means a space within a building, including a ceiling or under-floor supply air plenum or return air plenum, where the environment is likely, by the intended use of the space, to have its temperature controlled by *air-conditioning*, but does not include—

(a) a non-*habitable room* of a Class 2 building or Class 4 part of a building in which a heater with a capacity of not more than 1.2 kW or 4.3 MJ/hour provides the *air-conditioning*; or

(b) a space in a Class 6, 7, 8 or 9b building where the input energy to an *air-conditioning* system is not more than 15 W/m^2 or 15 $J/s.m^2$ (54 $KJ/hour.m^2$).

Construction activity actions means actions due to stacking of building materials or the use of equipment, including cranes and trucks, during construction or actions which may be induced by floor to floor propping.

Critical radiant flux means the critical heat flux at extinguishment as determined by AS ISO 9239.1.

Curtain wall means a non-*loadbearing external wall* that is not a *panel wall*.

Deemed-to-Satisfy Provisions means provisions which are deemed to satisfy the *Performance Requirements*.

(NSW, Designated bushfire prone area)

Designated bushfire prone area means land which has been designated under a power of legislation as being subject, or likely to be subject, to bushfires.

Detention centre means a building in which persons are securely detained by means of the built structure including a prison, remand centre, juvenile *detention centre*, holding cells or psychiatric *detention centre*.

(NSW, Early childhood centre)

(Tas, Early childhood centre)

(Vic, Early childhood centre)

Early childhood centre means any premises or part thereof providing or intending to provide a centre-based education and care service within the meaning of the Education and Care Services National Law Act 2010 (Vic), the Education and Care Services National Regulations and centre-based services that are licensed or approved under State and Territory children's services law, but excludes education and care primarily provided to school aged children in outside school hours settings.

Effective height means the height to the floor of the topmost *storey* (excluding the topmost *storey* if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units) from the floor of the lowest *storey* providing direct egress to a road or *open space*.

Electricity network substation means a building in which high voltage supply is converted or transformed and which is controlled by a licenced network service provider designated under a power of legislation.

Envelope, for the purposes of **Section J**, means the parts of a building's *fabric* that separate a *conditioned space* or *habitable room* from—

(a) the exterior of the building; or

(b) a non-*conditioned space* including—

(i) the floor of a rooftop plant room, lift-machine room or the like; and

(ii) the floor above a *carpark* or warehouse; and

(iii) the *common wall* with a *carpark*, warehouse or the like.

Equivalent means equivalent to the level of health, safety and amenity provided by the *Deemed-to-Satisfy Provisions*.

Evacuation route means the continuous path of travel (including *exits*, *public corridors* and the like) from any part of a building, including within a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part, to a *safe place*.

Evacuation time means the time calculated from when the emergency starts for the occupants of the building to evacuate to a *safe place*.

Exit means—

(a) Any, or any combination of the following if they provide egress to a road or *open space*—

(i) An internal or external stairway.

(ii) A ramp.

(iii) A *fire-isolated passageway*.

(iv) A doorway opening to a road or *open space*.

(b) A *horizontal exit* or a *fire-isolated passageway* leading to a *horizontal exit*.

Expert Judgement means the judgement of an expert who has the qualifications and experience to determine whether a *Building Solution* complies with the *Performance Requirements*.

External wall means an outer wall of a building which is not a *common wall*.

Fabric means the basic building structural elements and components of a building including the roof, ceilings, walls and floors.

Fan Power means the power delivered to a fan, including the power needed for any drive.

Fire brigade means a statutory authority constituted under an Act of Parliament having as one of its functions, the protection of life and property from fire and other emergencies.

Fire **compartment** means—

(a) the total space of a building, or

(b) when referred to in—

(i) the *Objective, Functional Statement* or *Performance Requirements* — any part of a building separated from the remainder by barriers to fire such as walls and/or floors having an appropriate resistance to the spread of fire with any openings adequately protected; or

(ii) the *Deemed-to-Satisfy Provisions* — any part of a building separated from the remainder by walls and/or floors each having an FRL not less than that *required* for a *fire wall* for that type of construction and where all openings in the separating construction are protected in accordance with the *Deemed-to-Satisfy Provisions* of the relevant Part.

Fire hazard means the danger in terms of potential harm and degree of exposure arising from the start and spread of fire and the smoke and gases that are thereby generated.

Fire hazard properties means the following properties of a material or assembly that indicate how they behave under specific fire test conditions:

(a) *Average specific extinction area*, *critical radiant flux* and *Flammability Index*, determined as defined in **A1.1**.

(b) *Smoke-Developed Index*, *smoke growth rate index*, *smoke development rate* and *Spread-of-Flame Index*, determined in accordance with **Specification A2.4**.

(c) *Group number*, determined in accordance with **Specification C1.10**.

Fire intensity means the rate release of calorific energy in watts, determined either theoretically or empirically, as applicable.

Fire-isolated passageway means a corridor, hallway or the like, of *fire-resisting construction*, which provides egress to or from a *fire-isolated stairway* or *fire-isolated ramp* or to a road or *open space*.

Fire-isolated ramp means a ramp within a *fire-resisting* enclosure which provides egress from a *storey*.

Fire-isolated stairway means a stairway within a *fire-resisting shaft* and includes the floor and roof or top enclosing structure.

Fire load means the sum of the net calorific values of the *combustible* contents which can reasonably be expected to burn within a *fire compartment*, including furnishings, built-in and removable materials, and building elements. The calorific values must be determined at the ambient moisture content or humidity. (The unit of measurement is MJ.)

Fire-protective covering means—

(a) 13 mm fire-protective grade plasterboard; or

(b) 12 mm cellulose cement flat sheeting complying with AS/NZS 2908.2 or ISO 8336; or

(c) 12 mm fibrous plaster reinforced with 13 mm x 13 mm x 0.7 mm galvanised steel wire mesh located not more than 6 mm from the exposed face; or

(d) other material not less fire-protective than 13 mm fire-protective grade plasterboard,

fixed in accordance with the normal trade practice for a *fire-protective covering*.

Fire-resistance level (FRL) means the grading periods in minutes determined in accordance with **Specification A2.3**, for the following criteria—

(a) *structural adequacy*; and

(b) *integrity*; and

(c) *insulation*,

and expressed in that order.

Note:

A dash means that there is no requirement for that criterion. For example, 90/–/– means there is no requirement for an FRL for integrity and insulation, and –/–/– means there is no requirement for an FRL.

Fire-resisting, applied to a building element, means having an FRL appropriate for that element.

Fire-resisting construction means one of the Types of construction referred to in **Part C1**.

Fire safety system means one or any combination of the methods used in a building to—

(a) warn people of an emergency; or
(b) provide for safe evacuation; or
(c) restrict the spread of fire; or
(d) extinguish a fire,

and includes both active and passive systems.

Fire-source feature means—

(a) the far boundary of a road, river, lake or the like adjoining the allotment; or
(b) a side or rear boundary of the allotment; or
(c) an *external wall* of another building on the allotment which is not a Class 10 building.

Fire wall means a wall with an appropriate resistance to the spread of fire that divides a *storey* or building into *fire compartments*.

Flashover, in relation to *fire hazard properties*, means a heat release rate of 1 MW.

Flammability Index means the index number as determined by AS 1530.2.

Flight means that part of a stairway that has a continuous series of risers, including risers of winders, not interrupted by a landing or floor.

Floor area means—

(a) in relation to a building — the total area of all *storeys*; and
(b) in relation to a *storey* — the area of all floors of that *storey* measured over the enclosing walls, and includes—
    (i) the area of a *mezzanine* within the *storey*, measured within the finished surfaces of any *external walls*; and
    (ii) the area occupied by any *internal walls* or partitions, any cupboard, or other built-in furniture, fixture or fitting; and
    (iii) if there is no enclosing wall, an area which has a use that—
        (A) contributes to the *fire load*; or
        (B) impacts on the safety, health or amenity of the occupants in relation to the provisions of the BCA; and
(c) in relation to a room — the area of the room measured within the finished surfaces of the walls, and includes the area occupied by any cupboard or other built-in furniture, fixture or fitting; and
(d) in relation to a *fire compartment* — the total area of all floors within the *fire compartment* measured within the finished surfaces of the bounding construction, and if there is no bounding construction, includes an area which has a use which contributes to the *fire load*; and
(e) in relation to an *atrium* — the total area of all floors within the *atrium* measured within the finished surfaces of the bounding construction and if no bounding construction, within the *external walls*.

Functional Statement means a statement which describes how a building achieves the *Objective*.

Glazing, for the purposes of **Section J**, means a transparent or translucent element and its supporting frame located in the *envelope*, and includes a *window* other than a *roof light*.

Group number means the number of one of 4 groups of materials used in the regulation of *fire hazard properties* and applied to materials used as a finish, surface, lining, or attachment to a wall or ceiling.

Habitable room means a room used for normal domestic activities, and—

(a) includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom; but

(b) excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.

Health-care building means a building whose occupants or patients undergoing medical treatment generally need physical assistance to evacuate the building during an emergency and includes—

(a) a public or private hospital; or

(b) a nursing home or similar facility for sick or disabled persons needing full-time care; or

(c) a clinic, day surgery or procedure unit where the effects of the predominant treatment administered involve patients becoming non-ambulatory and requiring supervised medical care on the premises for some time after the treatment.

Horizontal exit means a *required* doorway between 2 parts of a building separated from each other by a *fire wall*.

House energy rating software means software accredited under the Nationwide House Energy Rating Scheme and is limited to assessing the potential thermal efficiency of the dwelling envelope.

Illuminance means the luminous flux falling onto a unit area of surface.

Illumination power density means the total of the power (in W/m^2) that will be consumed by the lights in a space, including any lamps, ballasts, current regulators and control devices other than those that are plugged into socket outlets for intermittent use such as floor standing lamps, desk lamps or work station lamps, divided by the area of the space.

Insulation, in relation to an FRL, means the ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS 1530.4.

Integrity, in relation to an FRL, means the ability to resist the passage of flames and hot gases specified in AS 1530.4.

Internal wall excludes a *common wall* or a party wall.

Lamp power density means the total of the maximum power (in W/m^2) rating of the lamps in a space, other than those that are plugged into socket outlets for intermittent use such as floor standing lamps, desk lamps or work station lamps, divided by the area of the space.

Latent heat gain means the heat gained by the vapourising of liquid without change of temperature.

Light source efficacy means the luminous flux of a lamp or the total radiant flux in the visible spectrum weighted by the spectral response of the eye, divided by the electric power that will be consumed by the lamp but excluding ballast and control gear power losses.

Lightweight construction means construction which incorporates or comprises—

(a) sheet or board material, plaster, render, sprayed application, or other material similarly susceptible to damage by impact, pressure or abrasion; or

(b) concrete and concrete products containing pumice, perlite, vermiculite, or other soft material similarly susceptible to damage by impact, pressure or abrasion; or

(c) masonry having a thickness less than 70 mm.

Loadbearing means intended to resist vertical forces additional to those due to its own weight.

Luminance contrast means the light reflected from one surface or component, compared to the light reflected from another surface or component.

Mezzanine means an intermediate floor within a room.

Non-combustible means—

(a) Applied to a material — not deemed *combustible* as determined by AS 1530.1 — Combustibility Tests for Materials.

(b) Applied to construction or part of a building — constructed wholly of materials that are not deemed *combustible*.

Objective means a statement contained in the BCA which is considered to reflect community expectations.

Open-deck carpark means a carpark in which all parts of the parking *storeys* are cross-ventilated by permanent unobstructed openings in not fewer than 2 opposite or approximately opposite sides, and—

(a) each side that provides ventilation is not less than $^1/_6$ of the area of any other side; and

(b) the openings are not less than ½ of the wall area of the side concerned.

Open space means a space on the allotment, or a roof or similar part of a building adequately protected from fire, open to the sky and connected directly with a public road.

Open spectator stand means a tiered stand substantially open at the front.

Other property means all or any of the following—

(a) any building on the same or an adjoining allotment; and

(b) any adjoining allotment; and

(c) a road.

Outdoor air means air outside the building.

Outdoor air economy cycle is a mode of operation of an *air-conditioning* system that, when the outside air thermodynamic properties are favourable, increases the quantity of outside air used to condition the space.

Outfall means that part of the disposal system receiving *surface water* from the drainage system and may include a natural water course, kerb and channel, or soakage system.

Panel wall means a non-*loadbearing external wall*, in frame or similar construction, that is wholly supported at each *storey*.

Patient care area means a part of a *health-care building* normally used for the treatment, care, accommodation, recreation, dining and holding of patients including a *ward area* and *treatment area*.

Performance Requirement means a requirement which states the level of performance which a *Building Solution* must meet.

Personal care services means any of the following.

(a) The provision of nursing care.

(b) Assistance or supervision in—

(i) bathing, showering or personal hygiene; or

(ii) toileting or continence management; or

(iii) dressing or undressing; or

(iv) consuming food.

(c) The provision of direct physical assistance to a person with mobility problems.

(d) The management of medication.

(e) The provision of substantial rehabilitative or development assistance.

Piping, for the purposes of **Section J**, means an assembly of pipes, with or without valves or other fittings, connected together for the conveyance of liquids and gases.

Primary building element means a member of a building designed specifically to take part of the loads specified in **B1.2** or **B1.3** and includes roof, ceiling, floor, stairway or ramp and wall framing members including bracing members designed for the specific purpose of acting as a brace to those members.

Private bushfire shelter means a structure associated with, but not attached to, or part of a Class 1a dwelling that may, as a last resort, provide shelter for occupants from immediate life threatening effects of a bushfire.

Private garage means—

(a) any garage associated with a Class 1 building; or

(b) any single *storey* of a building of another Class containing not more than 3 vehicle spaces, if there is only one such *storey* in the building; or

(c) any separate single *storey* garage associated with another building where such garage contains not more than 3 vehicle spaces.

Professional engineer means a person who is—

(a) if legislation is applicable — a registered *professional engineer* in the relevant discipline who has appropriate experience and competence in the relevant field; or

(b) if legislation is not applicable—

(i) a Corporate Member of the Institution of Engineers, Australia; or

(ii) eligible to become a Corporate Member of the Institution of Engineers, Australia, and has appropriate experience and competence in the relevant field.

Public corridor means an enclosed corridor, hallway or the like which—

(a) serves as a means of egress from 2 or more *sole-occupancy units* to a *required exit* from the *storey* concerned; or

(b) is *required* to be provided as a means of egress from any part of a *storey* to a *required exit*.

Pump power means the power delivered to a pump, including the power needed for any drive.

R-Value means the thermal resistance (m^2.K/W) of a component calculated by dividing its thickness by its thermal conductivity.

Reference building means a hypothetical building that is used to calculate the maximum allowable annual energy load, or maximum allowable *annual energy consumption* for the proposed building.

Reflective insulation means a building membrane with a reflective surface such as a reflective foil laminate, reflective barrier, foil batt or the like capable of reducing radiant heat flow.

Registered Testing Authority means—

(a) an organisation registered by the National Association of Testing Authorities (NATA) to test in the relevant field; or

(b) an organisation outside Australia registered by an authority recognised by NATA through a mutual recognition agreement; or

(c) an organisation recognised as being a *Registered Testing Authority* under legislation at the time the test was undertaken.

Renewable energy means energy that is derived from sources that are regenerated, replenished, or for all practical purposes cannot be depleted and the energy sources include, but are not limited to, solar, wind, hydroelectric, wave action and geothermal.

Required means *required* to satisfy a *Performance Requirement* or a *Deemed-to-Satisfy Provision* of the BCA as appropriate.

Residential aged care building means a building whose residents, due to their incapacity associated with the ageing process, are provided with physical assistance in conducting their daily activities and to evacuate the building during an emergency.

Resident use area means part of a Class 9c *aged care building* normally used by residents, and—

(a) includes *sole-occupancy units*, lounges, dining areas, activity rooms and the like; but

(b) excludes offices, storage areas, commercial kitchens, commercial laundries and other spaces not for the use of residents.

Resistance to the incipient spread of fire, in relation to a ceiling membrane, means the ability of the membrane to insulate the space between the ceiling and roof, or ceiling and floor above, so as to limit the temperature rise of materials in this space to a level which will not permit the rapid and general spread of fire throughout the space.

Rise in storeys means the greatest number of *storeys* calculated in accordance with **C1.2**.

Roof light, for the purposes of **Section J** and **Part F4**, means a skylight, *window* or the like installed in a roof—

(a) to permit natural light to enter the room below; and

(b) at an angle between 0 and 70 degrees measured from the horizontal plane.

Safe place means—

(a) a place of safety within a building—

(i) which is not under threat from a fire; and

(ii) from which people must be able to safely disperse after escaping the effects of an emergency to a road or *open space*; or

(b) a road or *open space*.

Safety measure means any measure (including an item of equipment, form of construction or safety strategy) *required* to ensure the safety of persons using the building.

Sanitary compartment means a room or space containing a closet pan or urinal.

Sarking-type material means a material such as a *reflective insulation* or other flexible membrane of a type normally used for a purpose such as water proofing, vapour proofing or thermal reflectance.

School includes a primary or secondary *school*, college, university or similar educational establishment.

Self-closing, applied to a door, means equipped with a device which returns the door to the fully closed position immediately after each opening.

Sensible heat gain means the heat gained which causes a change in temperature.

Service, for the purposes of **Part I2** and **Section J**, means a mechanical or electrical system that uses energy to provide *air-conditioning*, mechanical ventilation, hot water supply, artificial lighting, vertical transport and the like within a building, but which does not include—

(a) systems used solely for emergency purposes; and

(b) cooking facilities; and

(c) portable appliances.

Service station means a garage which is not a *private garage* and is for the servicing of vehicles, other than only washing, cleaning or polishing.

Shaft means the walls and other parts of a building bounding—

(a) a well, other than an *atrium well*; or

(b) a vertical chute, duct or similar passage, but not a chimney or flue.

Shower area means the area affected by water from a shower, including a shower over a bath.

Site means the part of the allotment of land on which a building stands or is to be erected.

Sitework means work on or around a *site*, including earthworks, preparatory to or associated with the construction, *alteration*, demolition or removal of a building.

Smoke-and-heat vent means a vent, located in or near the roof for smoke and hot gases to escape if there is a fire in the building.

Smoke-Developed Index means the index number for smoke as determined by AS/NZS 1530.3.

Smoke development rate means the development rate for smoke as determined by testing flooring materials in accordance with AS ISO 9239.1.

Smoke growth rate index ($SMOGRA_{RC}$) means the index number for smoke used in the regulation of *fire hazard properties* and applied to materials used as a finish, surface, lining or attachment to a wall or ceiling.

Solar Heat Gain Coefficient (SHGC) means the fraction of incident irradiance on *glazing* or a *roof light* that adds heat to a building's space.

Sole-occupancy unit means a room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and includes—

(a) a dwelling; or

(b) a room or suite of rooms in a Class 3 building which includes sleeping facilities; or

(c) a room or suite of associated rooms in a Class 5, 6, 7, 8 or 9 building; or

(d) a room or suite of associated rooms in a Class 9c *aged care building*, which includes sleeping facilities and any area for the exclusive use of a resident.

Spread-of-Flame Index means the index number for spread of flame as determined by AS/NZS 1530.3.

Stage means a floor or platform in a Class 9b building on which performances are presented before an audience.

Standard Fire Test means the Fire-resistance Tests of Elements of Building Construction as described in AS 1530.4.

Storey means a space within a building which is situated between one floor level and the floor level next above, or if there is no floor above, the ceiling or roof above, but not—

(a) a space that contains only—

(i) a lift *shaft*, stairway or meter room; or

(ii) a bathroom, shower room, laundry, water closet, or other *sanitary compartment*; or

(iii) accommodation intended for not more than 3 vehicles; or

(iv) a combination of the above; or

(b) a *mezzanine*.

Structural adequacy, in relation to an FRL, means the ability to maintain stability and adequate *loadbearing* capacity as determined by AS 1530.4.

Surface water means all naturally occurring water, other than sub-*surface water*, which results from rainfall on or around the *site* or water flowing onto the *site*, including that flowing from a drain, stream, river, lake or sea.

Swimming pool means any excavation or structure containing water and used primarily for swimming, wading, paddling, or the like, including a bathing or wading pool, or spa.

Total R-Value means the sum of the *R-Values* of the individual component layers in a composite element including any building material, insulating material, airspace and associated surface resistances.

Total U-Value means the thermal transmittance ($W/m^2.K$) of the composite element allowing for the effect of any airspaces and associated surface resistances.

Treatment area means an area within a *patient care area* such as an operating theatre and rooms used for recovery, minor procedures, resuscitation, intensive care and coronary care from which a patient may not be readily moved.

Verification Method means a test, inspection, calculation or other method that determines whether a *Building Solution* complies with the relevant *Performance Requirements*.

Vessel means an open, pre-formed, pre-finished concave receptacle capable of holding water, usually for the purpose of washing, including a basin, sink, bath, laundry tub and the like.

Ward area means that part of a *patient care area* for resident patients and may contain areas for accommodation, sleeping, associated living and nursing facilities.

Waterproof means waterproof as determined by AS 3740.

Water resistant means water resistant as determined by AS 3740.

Wet area means an area within a building supplied with water from a water supply system, which includes bathrooms, showers, laundries and *sanitary compartments* and excludes kitchens, bar areas, kitchenettes or domestic food and beverage preparation areas.

Window includes a roof light, glass panel, glass block or brick, glass louvre, glazed sash, glazed door, or other device which transmits natural light directly from outside a building to the room concerned when in the closed position.

A1.2 Adoption of Standards and other references

Where a *Deemed-to-Satisfy Provision* references a document, rule, specification or provision, that adoption does not include a provision—

(a) specifying or defining the respective rights, responsibilities or obligations as between themselves of any manufacturer, supplier or purchaser; or

(b) specifying the responsibilities of any trades person or other building operative, architect, engineer, authority, or other person or body; or

(c) requiring the submission for approval of any material, building component, form or method of construction, to any person, authority or body other than a person or body empowered under State or Territory legislation to give that approval; or

(d) specifying that a material, building component, form or method of construction must be submitted to any person, authority or body for expression of opinion; or

(e) permitting a departure from the code, rule, specification or provision at the sole discretion of the manufacturer or purchaser, or by arrangement or agreement between the manufacturer and purchaser.

A1.3 Referenced Standards, etc

(a) A reference in a *Deemed-to-Satisfy Provision* to a document under **A1.2** refers to the edition or issue, together with any amendment, listed in **Specification A1.3** and only so much as is relevant in the context in which the document is quoted.

(b) Any—

(i) reference in a document listed in **Specification A1.3** (primary document) to another document (secondary document); and

(ii) subsequent references to other documents in secondary documents and those other documents,

is a reference to the secondary and other documents as they existed at the time of publication of the primary document listed in **Specification A1.3**.

(c) The provisions of **(b)** do not apply if the secondary referenced document is also a primary referenced document.

(d) Where the BCA references a document under **A1.2** which is subject to publication of a new edition or amendment not listed under **Specification A1.3**, the new edition or amendment need not be complied with in order to comply with the *Deemed-to-Satisfy Provisions*.

A1.4 Differences between referenced documents and the BCA

The BCA overrules in any difference arising between it and any Standard, rule, specification or provision in a document listed in **Specification A1.3**.

A1.5 Compliance with all Sections of the BCA

Subject to **A1.6**, Class 2–9 buildings must be so designed and constructed that they comply with the relevant provisions of Sections **A** to **J** (inclusive) of the BCA.

A1.6 Application of the BCA to a particular State or Territory

For application within a particular State or Territory, the BCA comprises—

(a) Sections **A** to **J** (inclusive); and

(b) the variations, deletions and additions to Sections **A** to **J** applicable to that State or Territory specified in the relevant Appendix.

A1.7 Language

(a) A reference to a building in the BCA is a reference to an entire building or part of a building, as the case requires.

(b) A reference in a *Performance Requirement* of the BCA to "the degree necessary" means that consideration of all the criteria referred to in the *Performance Requirement* will determine the outcome appropriate to the circumstances. These words have been inserted to indicate that in certain situations it may not be necessary to incorporate any specific measures to meet the *Performance Requirement*.

(c) A reference to "BCA" in this volume, other than in the **Introduction**, means "Volume One of the Building Code of Australia".

PART A2 ACCEPTANCE OF DESIGN AND CONSTRUCTION

A2.1 Suitability of materials

Every part of a building must be constructed in an appropriate manner to achieve the requirements of the BCA, using materials that are fit for the purpose for which they are intended.

A2.2 Evidence of suitability

(a) Subject to **A2.3** and **A2.4**, evidence to support that the use of a material, form of construction or design meets a *Performance Requirement* or a *Deemed-to-Satisfy Provision* may be in the form of one or a combination of the following:

(i) A report issued by a *Registered Testing Authority*, showing that the material or form of construction has been submitted to the tests listed in the report, and setting out the results of those tests and any other relevant information that demonstrates its suitability for use in the building.

(ii) A current *Certificate of Conformity* or a current *Certificate of Accreditation*.

(iii) A certificate from a *professional engineer* or other appropriately qualified person which—

(A) certifies that a material, design, or form of construction complies with the requirements of the BCA; and

(B) sets out the basis on which it is given and the extent to which relevant specifications, rules, codes of practice or other publications have been relied upon.

(iv) A current certificate issued by a product certification body that has been accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

(v) * * * * *

(vi) Any other form of documentary evidence that correctly describes the properties and performance of the material,

(b) Evidence to support that a calculation method complies with an ABCB protocol may be in the form of one or a combination of the following:

(i) A certificate from a *professional engineer* or other appropriately qualified person which—

(A) certifies that the calculation method complies with a relevant ABCB protocol; and

(B) sets out the basis on which it is given and the extent to which relevant specifications, rules, codes of practice and other publications have been relied upon.

(ii) Any other form of documentary evidence that correctly describes how the calculation method complies with a relevant ABCB protocol.

(c) Any copy of documentary evidence submitted, must be a complete copy of the original report or document.

A2.3 Fire-resistance of building elements

Where a *Deemed-to-Satisfy Provision* requires a building element to have an FRL, it must be determined in accordance with **Specification A2.3**.

A2.4 Fire hazard properties

Where a *Deemed-to-Satisfy Provision* requires a building component or assembly to have *a fire hazard property* it must be determined as follows:

(a) For *average specific extinction area*, *critical radiant flux* or *Flammability Index* — as defined in **A1.1**.

(b) For *Smoke-Developed Index*, *Spread-of-Flame Index*, a material's *group number* or *smoke growth rate index* ($SMOGRA_{RC}$) — in accordance with **Specification A2.4**.

A2.5 Resistance to the incipient spread of fire

A ceiling is deemed to have the *resistance to the incipient spread of fire* to the space above itself if—

(a) it is identical with a prototype that has been submitted to the *Standard Fire Test* and the *resistance to the incipient spread of fire* achieved by the prototype is confirmed in a report from a *Registered Testing Authority* which—

  (i) describes the method and conditions of the test and form of construction of the tested prototype in full; and

  (ii) certifies that the application of restraint to the prototype complies with the *Standard Fire Test*; or

(b) it differs in only a minor degree from a prototype tested under **(a)** and the *resistance to the incipient spread of fire* attributed to the ceiling is confirmed in a report from a *Registered Testing Authority* which—

  (i) certifies that the ceiling is capable of achieving the *resistance to the incipient spread of fire* despite the minor departures from the tested prototype; and

  (ii) describes the materials, construction and conditions of restraint which are necessary to achieve the *resistance to the incipient spread of fire*.

ACT AO2 to A2.102

PART A3 CLASSIFICATION OF BUILDINGS AND STRUCTURES

A3.1 Principles of classification

The classification of a building or part of a building is determined by the purpose for which it is designed, constructed or adapted to be used.

A3.2 Classifications

Buildings are classified as follows:

Class 1: one or more buildings which in association constitute—

(a) **Class 1a** — a single dwelling being—

(i) a detached house; or

(ii) one of a group of two or more attached dwellings, each being a building, separated by a *fire-resisting* wall, including a row house, terrace house, town house or villa unit; or

(b) **Class 1b** —

(i) a boarding house, guest house, hostel or the like—

(A) with a total area of all floors not exceeding 300 m^2 measured over the enclosing walls of the Class 1b; and

(B) in which not more than 12 persons would ordinarily be resident; or

(ii) 4 or more single dwellings located on one allotment and used for short-term holiday accommodation,

which are not located above or below another dwelling or another Class of building other than a *private garage*.

Class 2: a building containing 2 or more *sole-occupancy units* each being a separate dwelling.

Class 3: a residential building, other than a building of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons, including—

(a) a boarding house, guest house, hostel, lodging house or backpackers accommodation; or

(b) a residential part of a hotel or motel; or

(c) a residential part of a *school*, or

(d) accommodation for the aged, children or people with disabilities; or

(e) a residential part of a *health-care building* which accommodates members of staff, or

(f) a residential part of a *detention centre*.

Class 4: a dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.

Class 5: an office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.

NSW Class 6

Class 6: a shop or other building for the sale of goods by retail or the supply of services direct to the public, including—

(a) an eating room, café, restaurant, milk or soft-drink bar; or

(b) a dining room, bar area that is not an *assembly building*, shop or kiosk part of a hotel or motel; or

(c) a hairdresser's or barber's shop, public laundry, or undertaker's establishment; or

(d) market or sale room, showroom, or *service station*.

Class 7: a building which is—

(a) **Class 7a** — a *carpark*; or

(b) **Class 7b** — for storage, or display of goods or produce for sale by wholesale.

Class 8: a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale, or gain.

Class 9: a building of a public nature—

(a) **Class 9a** — a *health-care building*, including those parts of the building set aside as a laboratory; or

(b) **Class 9b** — an *assembly building*, including a trade workshop, laboratory or the like in a primary or secondary *school*, but excluding any other parts of the building that are of another Class; or

(c) **Class 9c** — an *aged care building*.

Class 10: a non-habitable building or structure—

(a) **Class 10a** — a non-habitable building being a *private garage*, carport, shed, or the like; or

(b) **Class 10b** — a structure being a fence, mast, antenna, retaining or free-standing wall, *swimming pool*, or the like; or

(c) **Class 10c** — a *private bushfire shelter*.

A3.3 Multiple classification

Each part of a building must be classified separately, and—

(a)

(i) where parts have different purposes — if not more than 10% of the *floor area* of a *storey*, being the minor use, is used for a purpose which is a different classification, the classification applying to the major use may apply to the whole storey; and

(ii) the provisions of (i) do not apply when the minor use is a laboratory or Class 2, 3 or 4 part; and

(b) Classes 1a, 1b, 7a, 7b, 9a, 9b, 9c, 10a, 10b and 10c are separate classifications; and

(c) a reference to—

(i) Class 1 — is to Class 1a and 1b; and

(ii) Class 7 — is to Class 7a and 7b; and

(iii) Class 9 — is to Class 9a, 9b and 9c; and

(iv) Class 10 — is to Class 10a, 10b and 10c; and

(d) A plant room, machinery room, lift motor room, boiler room or the like must have the same classification as the part of the building in which it is situated.

A3.4 Parts with more than one classification

(a) Notwithstanding **A3.3**, a building or part of a building may have more than one classification applying to the whole building or to the whole of that part of the building.

(b) If a building or part of a building has more than one classification applying to the whole building or part in accordance with **(a)**, that building or part must comply with all the relevant provisions of the BCA for each classification.

PART A4 UNITED BUILDINGS

A4.1 When buildings are united

Two or more buildings adjoining each other form one united building if they—

(a) are connected through openings in the walls dividing them; and

(b) together comply with all the requirements of the BCA as though they are a single building.

A4.2 Alterations in a united building

If, after *alterations* or any other building work, two or more of the buildings in **A4.1** cease to be connected through openings in the dividing walls, each of those buildings not now connected must comply with all the requirements for a single building.

SPECIFICATION A1.3 DOCUMENTS ADOPTED BY REFERENCE

1. Schedule of referenced documents

ACT, NSW, NT, QLD, SA, Tas, Vic Spec A1.3 Table 1

The Standards and other documents listed in **Table 1** are referred to in Volume One of the BCA.

Table 1: SCHEDULE OF REFERENCED DOCUMENTS

No.	Date	Title	BCA Clause(s)
AS/ISO 717		Acoustics — Rating of sound insulation in buildings and building elements	
Part 2	2004	Impact sound insulation	**F5.3**
AS/NZS 1170		Structural design actions	
Part 0	2002	General principles	**B1.1, B1.2, Spec B1.2**
		Amdt 1	
		Amdt 3	
		Amdt 4	
Part 1	2002	Permanent, imposed and other actions	**B1.2**
		Amdt 1	
		Amdt 2	
Part 2	2002	Wind actions	**B1.2, Spec B1.2**
		Amdt 1	
Part 2	2011	Wind actions	**B1.2, Spec B1.2**
Part 3	2003	Snow and ice actions	**B1.2**
		Amdt 1	
AS 1170		Structural design actions	
Part 4	2007	Earthquake actions in Australia	**B1.2**
AS 1191	2002	Acoustics — Method for laboratory measurement of airborne sound insulation of building elements	**Spec F5.5**

A GENERAL PROVISIONS

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
AS/NZS 1200	2000	Pressure equipment	**G2.2**
AS/NZS 1276		Acoustics — Rating of sound insulation in buildings and of building elements	
Part 1	1999	Airborne sound insulation [Note: Test reports based on AS1276 – 1979 and issued prior to AS/NZS 1276.1 – 1999 being referenced in the BCA, remain valid. The STC values in reports based on AS 1276 – 1979 shall be considered to be equivalent to R_w values. Test reports prepared after the BCA reference date for AS/NZS 1276.1 – 1999 must be based on that version]	**F5.2**
AS 1288	2006	Glass in buildings — Selection and Installation Amdt 1 Amdt 2	**B1.4, Spec C2.5, Spec C3.4**
AS 1428		Design for access and mobility	
Part 1	2009	General requirements for access — New building work Amdt 1	**A1.1, D2.10, D3.1, D3.2, D3.3, D3.6, D3.8, D3.9, D3.10, D3.12, Spec D3.10, F2.4, G4.5**
Part 1	2001	General requirements for access — New building work	**H2.7, H2.8, H2.10, H2.15**
Part 1 (Supplement 1)	1993	General requirements for access — Buildings — Commentary	**H2.2**
Part 2	1992	Enhanced and additional requirements — Buildings and facilities	**H2.2, H2.3, H2.4, H2.5, H2.7, H2.10, H2.11, H2.12, H2.13, H2.14**

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
Part 4	1992	Tactile ground surface indicators for orientation of people with vision impairment	**H2.11**
AS/NZS 1428		Design for access and mobility	
Part 4.1	2009	Means to assist the orientation of people with vision impairment — Tactile ground surface indicators Amdt 1	**D3.8**
AS 1530		Methods for fire tests on building materials, components and structures	
Part 1	1994	Combustibility test for materials	**A1.1**
Part 2	1993	Test for flammability of materials Amdt 1	**A1.1**
Part 4	2005	Fire-resistance tests on elements of construction [Note: Subject to the note to AS 4072.1, reports relating to tests carried out under earlier editions of AS 1530 Parts 1 to 4 remain valid. Reports relating to tests carried out after the date of an amendment to a Standard must relate to the amended Standard]	**A1.1, C3.15, C3.16, Spec A2.4, Spec C3.15**
AS/NZS 1530		Methods for fire tests on building materials, components and structures	
Part 3	1999	Simultaneous determination of ignitability, flame propagation, heat release and smoke release	**A1.1, Spec A2.4**
AS 1562		Design and installation of sheet roof and wall cladding	
Part 1	1992	Metal Amdt 1	**B1.4, F1.5**

A GENERAL PROVISIONS

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
		Amdt 2	
AS/NZS 1562		Design and installation of sheet roof and wall cladding	
Part 2	1999	Corrugated fibre-reinforced cement	F1.5
Part 3	1996	Plastics	B1.4, F1.5
AS 1657	1992	Fixed platforms, walkways, stairways and ladders — Design, construction and installation (SAA Code for Fixed Platforms, Walkways, Stairways and Ladders)	D1.16, D2.18, H1.6
AS/NZS 1664		Aluminium structures	
Part 1	1997	Limit state design	B1.4
		Amdt 1	
Part 2	1997	Allowable stress design	B1.4
		Amdt 1	
AS/NZS 1668		The use of ventilation and airconditioning in buildings	
Part 1	1998	Fire and smoke control in multi-compartment buildings	C2.12, C3.15, Spec C2.5, D1.7, Spec E1.8, E2.2, Spec E2.2a, F4.12, Spec G3.8
		Amdt 1	
AS 1668		The use of mechanical ventilation and air-conditioning in buildings	
Part 2	1991	Mechanical ventilation for acceptable indoor-air quality	F4.5, F4.11, F4.12, J5.2
AS 1670		Fire detection, warning, control and intercom systems — Systems design, installation and commissioning	

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
Part 1	2004	Fire Amdt 1	C3.5, C3.6, C3.7, C3.8, C3.11, D2.21, G4.8, Spec C3.4, Spec E2.2a, Spec G3.8
Part 3	2004	Fire alarm monitoring	Spec E2.2a
Part 4	2004	Sound systems and intercom systems for emergency purposes	E4.9, Spec G3.8
AS/NZS 1680		Interior lighting	
Part 0	2009	Safe Movement	F4.4
AS 1684		Residential timber-framed construction	
Part 2	2010	Non-cyclonic areas	B1.4, B1.5, F1.12
Part 3	2010	Cyclonic areas	B1.4, B1.5, F1.12
Part 4	2010	Simplified — non-cyclonic areas	B1.4, B1.5, F1.12
AS 1720		Timber structures	
Part 1	2010	Design methods Amdt 1 Amdt 2	B1.4
Part 4	1990	Fire resistance of structural timber	Spec A2.3
AS 1735		Lifts, escalators and moving walks	
Part 1	2003	General requirements Amdt 1	Spec C1.8, E3.4, E3.5, E3.6, E3.7
Part 2	2001	Passenger and goods lifts — Electric	B1.4, Spec C1.8, Spec C1.10, D1.16, E3.4, E3.5, E3.6, E3.7,

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
Part 3	2002	Passenger and goods lifts — Electrohydraulic	**E3.6**
Part 7	1998	Stairway lifts	**E3.6**
Part 8	1986	Inclined lifts	**E3.6**
Part 11	1986	Fire-rated landing doors	**C3.10**
Part 12	1999	Facilities for persons with disabilities	**E3.6, H2.6**
		Amdt 1	
Part 14	1998	Low-rise platforms for passengers	**E3.6**
Part 15	2002	Lifts for people with limited mobility — Restricted use — Non-automatically controlled	**E3.6**
Part 16	1993	Lifts for persons with limited mobility — Restricted use — Automatically controlled	**E3.6**
AS 1860		Particleboard flooring	
Part 2	2006	Installation	**B1.4**
AS 1905		Components for the protection of openings in fire-resistant walls	
Part 1	2005	Fire-resistant doorsets	**C3.6, Spec C3.4**
Part 2	2005	Fire-resistant roller shutters	**Spec C3.4**
AS 1926		Swimming pool safety	
Part 1	2007	Safety barriers for swimming pools	**G1.1, G1.3**
		Amdt 1	
Part 2	2007	Location of safety barriers for swimming pools	**G1.1**
		Amdt 1	
		Amdt 2	
Part 3	2010	Water recirculation systems	**G1.1**
		Amdt 1	
AS 2047	1999	Windows in buildings — Selection and installation	**B1.4, F1.13, J3.4**

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
		Amdt 1 Amdt 2	
AS 2049	2002	Roof tiles Amdt 1	**B1.4, F1.5**
AS 2050	2002	Installation of roof tiles Amdt 1	**B1.4, F1.5**
AS 2118		Automatic fire sprinkler systems	
Part 1	1999	General requirements Amdt 1	**Spec E1.5**
Part 4	1995	Residential	**Spec E1.5**
Part 6	1995	Combined sprinkler and hydrant	**Spec E1.5**
AS 2159	2009	Piling — Design and installation Amdt 1	**B1.4**
AS 2293		Emergency escape lighting and exit signs for buildings	
Part 1	2005	System design, installation and operation Amdt 1	**E4.4, E4.8**
AS 2327		Composite structures	
Part 1	2003	Simply supported beams	**Spec A2.3, B1.4**
AS 2419		Fire hydrant installations	
Part 1	2005	System design, installation and commissioning Amdt 1	**C2.12, E1.3**
AS 2441	2005	Installation of fire hose reels Amdt 1	**E1.4**
AS 2444	2001	Portable fire extinguishers and fire blankets — Selection and location	**E1.6**
AS 2665	2001	Smoke/heat venting systems — Design, installation and commissioning	**Spec E2.2c, Spec G3.8**

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
AS 2870	1996	Residential slabs and footings — Construction Amdt 1 Amdt 2 Amdt 3 Amdt 4	F1.10
AS 2870	2011	Residential slabs and footings	F1.10
AS/NZS 2890		Parking facilities	
Part 6	2009	Off-street parking for people with disabilities	D3.5
AS/NZS 2904	1995	Damp-proof courses and flashings Amdt 1	F1.9
AS/NZS 2908		Cellulose cement products	
Part 1	2000	Corrugated sheets	B1.4, F1.5
Part 2	2000	Flat sheets	A1.1
AS/NZS 2918	2001	Domestic solid-fuel burning appliances — Installation	G2.2
AS/NZS 3013	2005	Electrical installations — Classification of the fire and mechanical performance of wiring system elements	C2.13
AS/NZS 3500		National plumbing and drainage	
Part 3	2003	Stormwater drainage Amdt 1 Amdt 2	F1.1
Part 4	2003	Heated water services Amdt 1 Amdt 2	J7.2
AS 3600	2009	Concrete structures Amdt 1	Spec A2.3, B1.4
AS 3660		Termite management	
Part 1	2000	New building work	B1.4, F1.9

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
AS/NZS 3666		Air-handling and water systems of buildings — Microbial control	
Part 1	2011	Design, installation and commissioning	**F2.7, F4.5**
Part 2	2011	Operation and maintenance	**I1.2**
AS 3700	2011	Masonry structures	**Spec A2.3, B1.4**
AS 3740	2010	Waterproofing of domestic wet areas	**F1.7**
AS 3786	1993	Smoke alarms Amdt 1 Amdt 2 Amdt 3 Amdt 4	**Spec E2.2a**
AS 3823		Performance of electrical appliances - Airconditioners and heat pumps	
Part 1.2	2001	Test Methods — Ducted airconditioners and air-to-air heat pumps — Testing and rating for performance Amdt 1 Amdt 2 Amdt 3 Amdt 4	**JV3, J5.4**
AS/NZS 3837	1998	Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter	**A1.1, Spec A2.4, Spec C1.10**
AS 3959	2009	Construction of buildings in bushfire-prone areas Amdt 1 Amdt 2 Amdt 3	**G5.2**

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
AS 4072		Components for the protection of openings in fire-resistant separating elements	
Part 1	2005	Service penetrations and control joints Amdt 1 [Note: Systems tested to AS 1530.4 prior to 1 January 1995 need not be retested to comply with the provisions in AS 4072.1]	**C3.15**
AS 4100	1998	Steel Structures Amdt 1	**Spec A2.3, B1.4**
AS/NZS 4200		Pliable building membranes and underlays	**F1.6**
Part 1	1994	Materials Amdt 1	
Part 2	1994	Installation requirements	
AS 4254	1995	Ductwork for air-handling systems in buildings Amdt 1 Amdt 2	**Spec C1.10, Spec J5.2**
AS/NZS 4256		Plastic roof and wall cladding materials	**B1.4, F1.5**
Part 1	1994	General requirements	
Part 2	1994	Unplasticized polyvinyl chloride (uPVC) building sheets	
Part 3	1994	Glass fibre reinforced polyester (GRP)	
Part 5	1996	Polycarbonate	
AS/NZS 4600	2005	Cold-formed steel structures Amdt 1	**B1.4**

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
AS/NZS 4859		Materials for the thermal insulation of buildings	
Part 1	2002	General criteria and technical provisions Amdt 1	**J1.2, Spec J5.2, Spec J5.4**
AS ISO 9239		Reaction to fire tests for flooring	
Part 1	2003	Determination of the burning behaviour using a radiant heat source	**A1.1**
AS ISO 9705	2003	Fire tests — Full-scale room test for surface products	**Spec A2.4, Spec C1.10**
AISC	1987	Guidelines for assessment of fire resistance of structural steel members	**Spec A2.3**
ASTM D3018-90	1994	Class A asphalt shingles surfaced with mineral granules	**B1.4, F1.5**
ASTM E72-80	1981	Standard method of conducting strength tests of panels for building construction	**Spec C1.8**
ASTM E695-79	1985	Standard method of measuring relative resistance of wall, floor and roof construction to impact loading	**Spec C1.8**
AHRI 460	2005	Remote mechanical-draft air-cooled refrigerant condensers	**J5.4**
AHRI 550/590	2003	Water chilling packages using the vapour compression cycle	**JV3, J5.4**
BS 7190	1989	Assessing thermal performance of low temperature hot water boilers using a test rig	**JV3, J5.4**
ABCB	2006	Protocol for Building Energy Analysis Software Version 2006.1	**JV3**
ABCB	2011	Protocol for Structural Software, Version 2011.1	**B1.5**
Disability Standards for Accessible Public Transport	2002		**H2.1**

Table 1: SCHEDULE OF REFERENCED DOCUMENTS (Continued)

No.	Date	Title	BCA Clause(s)
Education and Care Services National Law Act (Vic)	2010		**A1.1**
ISO 140		Acoustics — Measurement of sound insulation in buildings and of building elements	
Part 6	1998E	Laboratory measurements of impact sound insulation of floors	**Spec F5.5**
ISO 540	2008	Hard coal and coke — Determination of ash fusibility	**Spec C3.15**
ISO 717		Acoustics — Rating of sound insulation in buildings and of building elements	
Part 1	1996	Airborne sound insulation	**F5.2**
ISO 8336	1993E	Fibre cement flat sheets	**A1.1**
NASH Standard		Residential and low-rise steel framing	
Part 1	2005	Design criteria	**B1.4**
		Amdt A	
		Amdt B	
		Amdt C	

SPECIFICATION A2.3 FIRE-RESISTANCE OF BUILDING ELEMENTS

1. Scope

This Specification sets out the procedures for determining the FRL of building elements.

2. Rating

A building element meets the requirements of this Specification if—

(a) it is listed in, and complies with **Table 1** of this Specification; or

(b) it is identical with a prototype that has been submitted to the *Standard Fire Test*, or an equivalent or more severe test, and the FRL achieved by the prototype is confirmed in a report from a *Registered Testing Authority* which—

  (i) describes the method and conditions of the test and the form of construction of the tested prototype in full; and

  (ii) certifies that the application of restraint to the prototype complied with the *Standard Fire Test*; or

(c) it differs in only a minor degree from a prototype tested under **(b)** and the FRL attributed to the building element is confirmed in a report from a *Registered Testing Authority* which—

  (i) certifies that the building element is capable of achieving the FRL despite the minor departures from the tested prototype; and

  (ii) describes the materials, construction and conditions of restraint which are necessary to achieve the FRL; or

(d) it is designed to achieve the FRL in accordance with—

  (i) AS 2327.1, AS 4100 and AISC Guidelines for Assessment of Fire Resistance of Structural Steel Members if it is a steel or composite structure; or

  (ii) AS 3600 if it is a concrete structure; or

  (iii) AS 1720.4 if it is a solid or glued-laminated timber structure; or

  (iv) AS 3700 if it is a masonry structure; or

(e) the FRL is determined by calculation based on the performance of a prototype in the *Standard Fire Test* and confirmed in a report in accordance with **Clause 3**.

3. FRLs determined by calculation

If the FRL of a building element is determined by calculation based on a tested prototype—

(a) the building element may vary from the prototype in relation to—

  (i) length and height if it is a wall; and

  (ii) height if it is a column; and

(iii) span if it is a floor, roof or beam; and

(iv) conditions of support; and

(v) to a minor degree, cross-section and components; and

(b) the report must demonstrate by calculation that the building element would achieve the FRL if it is subjected to the regime of the *Standard Fire Test* in relation to—

(i) *structural adequacy* (including deflection); and

(ii) *integrity*; and

(iii) *insulation*; and

(c) the calculations must take into account—

(i) the temperature reached by the components of the prototype and their effects on strength and modulus of elasticity; and

(ii) appropriate features of the building element such as support, restraint, cross-sectional shape, length, height, span, slenderness ratio, reinforcement, ratio of surface area to mass per unit length, and fire protection; and

(iii) features of the prototype that influenced its performance in the *Standard Fire Test* although these features may not have been taken into account in the design for dead and live load; and

(iv) features of the conditions of test, the manner of support and the position of the prototype during the test, that might not be reproduced in the building element if it is exposed to fire; and

(v) the design load of the building element in comparison with the tested prototype.

4. Interchangeable materials

(a) Concrete and plaster — An FRL achieved with any material of Group A, B, C, D or E as an ingredient in concrete or plaster, applies equally when any other material of the same group is used in the same proportions:

Group A: Any portland cement.

Group B: Any lime.

Group C: Any dense sand.

Group D: Any dense calcareous aggregate, including any limestone or any calcareous gravel.

Group E: Any dense siliceous aggregate, including any basalt, diorite, dolerite, granite, granodiorite or trachyte.

(b) Perlite and vermiculite — An FRL achieved with either gypsum-perlite plaster or gypsum-vermiculite plaster applies equally for each plaster.

5. Columns covered with lightweight construction

If the *fire-resisting* covering of a steel column is *lightweight construction*, the construction must comply with **C1.8** and **C3.17**.

6. Non-loadbearing elements

If a non-*loadbearing* element is able to be used for a purpose where the *Deemed-to-Satisfy Provisions* prescribe an FRL for *structural adequacy*, *integrity* and *insulation*, that non-*loadbearing* element need not comply with the *structural adequacy* criteria.

Table 1 FRLs DEEMED TO BE ACHIEVED BY CERTAIN BUILDING ELEMENT

Building element	Minimum thickness (mm) of principal material for FRL's					Annexure reference
WALL						
	60/60/60	90/90/90	120/120/120	180/180/180	240/240/240	Clause
Masonry						
Ashlar	–	–	–	–	300	1, 2, 5, 6
Calcium silicate	see 2(d)(iv) of this Specification					
Concrete	see 2(d)(iv) of this Specification					
Fired clay (inc terracotta)	see 2(d)(iv) of this Specification					
Concrete						
No-fines	–	–	–	150	170	1, 5, 6
Prestressed	see 2(d)(ii) of this Specification					
Reinforced	see 2(d)(ii) of this Specification					
Plain	–	–	–	150	170	1, 5, 6
Solid gypsum blocks	75	90	100	110	125	1, 5, 6
Gypsum — perlite or Gypsum vermiculite-plaster on metal lath and channel (non-*loadbearing* walls only)	50	50	65	–	–	1, 5, 7
CONCRETE COLUMN						
	60/60/60	90/90/90	120/120/120	180/180/180	240/240/240	Clause
Prestressed	see 2(d)(ii) of this Specification					
Reinforced	see 2(d)(ii) of this Specification					
HOT-ROLLED STEEL COLUMN						
	60/60/60	90/90/90	120/120/120	180/180/180	240/240/240	Clause
(inc a fabricated column) exposed on no more than 3 sides:						8
Fire protection of **Concrete** — Cast in-situ—						
loadbearing	25	30	40	55	75	9, 11, 12
non-*loadbearing*-						
unplastered	25	30	40	50	65	9, 11, 12
plastered 13 mm—	25	25	30	40	50	1, 6, 9, 11, 12
Gypsum — Cast in-situ	–	–	–	–	50	9, 11, 12

Table 1 FRLs DEEMED TO BE ACHIEVED BY CERTAIN BUILDING ELEMENT (Continued)

Building element	Minimum thickness (mm) of principal material for FRL's					Annexure reference
Gypsum — perlite or Gypsum-vermiculite plaster						
sprayed to contour	20	25	35	50	55	1, 11
sprayed on metal lath	20	20	25	35	45	1, 7
HOT-ROLLED STEEL COLUMN						
	60/60/60	90/90/90	120/120/120	180/180/180	240/240/240	Clause
(inc a fabricated column) exposed on no more than 3 sides and with column spaces filled:						8, 9
Fire protection of—						
Solid calcium-silicate masonry	50	50	50	50	65	1, 3, 11, 12
Solid clay masonry	50	50	50	65	90	1, 3, 11, 12
Solid concrete masonry	50	50	50	65	90	1, 3, 11, 12
Solid gypsum blocks	50	50	50	50	65	1, 3, 11, 12
Hollow terracotta blocks						
plastered 13 mm	50	50	50	65	90	1, 3, 6, 10, 11, 12
HOT-ROLLED STEEL COLUMN						
	60/60/60	90/90/90	120/120/120	180/180/180	240/240/240	Clause
(inc a fabricated column) exposed on no more than 3 sides and with column spaces unfilled:						8
Fire protection of—						
Solid calcium-silicate masonry	50	50	50	–	–	1, 3, 11, 12
Solid clay masonry	50	50	65	–	–	1, 3, 11, 12
Solid concrete masonry	50	50	65	–	–	1, 3, 11, 12
Solid gypsum blocks	50	50	50	–	–	1, 3, 11, 12
Hollow terracotta blocks—						
plastered 13 mm	50	50	65	–	–	1, 3, 6, 10, 11, 12

Table 1 FRLs DEEMED TO BE ACHIEVED BY CERTAIN BUILDING ELEMENT (Continued)

Building element	Minimum thickness (mm) of principal material for FRL's					Annexure reference
HOT-ROLLED STEEL COLUMN						
	60/-/-	90/-/-	120/-/-	180/-/-	240/-/-	Clause
(inc. a fabricated column) exposed on 4 sides:						8
Fire protection of—						
Concrete — Cast in-situ—						
loadbearing	25	40	45	65	90	9, 11, 12
non-*loadbearing*-						
unplastered	25	30	40	50	65	9, 11, 12
plastered 13 mm	25	25	30	40	50	1, 6, 9, 11, 12
Gypsum — Cast in-situ	–	–	–	–	50	9, 11, 12
Gypsum-perlite or Gypsum-vermiculite plaster						
sprayed to contour	25	30	40	55	65	1, 11
sprayed on metal lath	20	20	30	40	50	1, 7
HOT-ROLLED STEEL COLUMN						
	60/-/-	90/-/-	120/-/-	180/-/-	240/-/-	Clause
(inc. a fabricated column) exposed on 4 sides and with column spaces filled:						8, 9
Fire protection of—						
Solid calcium-silicate masonry	50	50	50	65	75	1, 3, 11, 12,
Solid clay masonry	50	50	50	75	100	1, 3, 11, 12
Solid concrete masonry	50	50	50	75	100	1, 3, 11, 12
Solid gypsum blocks	50	50	50	65	75	1, 3, 11, 12
Hollow terracotta blocks—						
plastered 13 mm	50	50	50	75	100	1, 3, 6, 10, 11, 12
HOT-ROLLED STEEL COLUMN						
	60/-/-	90/-/-	120/-/-	180/-/-	240/-/-	Clause
(inc. a fabricated column) exposed on 4 sides and with column spaces unfilled:						8
Fire protection of—						
Solid calcium-silicate masonry	50	50	50	–	–	1, 3, 11, 12
Solid clay masonry	50	50	65	–	–	1, 3, 11, 12
Solid concrete masonry	50	50	65	–	–	1, 3, 11, 12

Table 1 FRLs DEEMED TO BE ACHIEVED BY CERTAIN BUILDING ELEMENT (Continued)

Building element	Minimum thickness (mm) of principal material for FRL's					Annexure reference
Solid gypsum blocks	50	50	50	–	–	1, 3, 11, 12
Hollow terracotta blocks—						
plastered 13 mm	50	50	65	–	–	1, 3, 6, 10, 11, 12
BEAM						
	60/-/-	90/-/-	120/-/-	180/-/-	240/-/-	Clause
Concrete—						
Prestressed		see 2(d)(ii) of this Specification				
Reinforced		see 2(d)(ii) of this Specification				
Hot-rolled Steel (inc. an open-web joist girder truss etc) exposed on no more than 3 sides						8
Fire protection of—						
Concrete — Cast in-situ	25	30	40	50	65	11, 12
Gypsum-perlite or Gypsum-vermiculite plaster						
sprayed to contour	20	25	35	50	55	1, 11
sprayed on metal lath	20	20	25	35	45	1, 7
Hot-rolled Steel (inc. an open-web joist girder truss etc) exposed on 4 sides						8
Fire protection of—						
Concrete — Cast in-situ	25	40	45	65	90	11, 12
Gypsum-perlite or Gypsum-vermiculite plaster—						
sprayed to contour	25	30	40	55	65	1, 11
sprayed on metal lath	20	20	30	40	50	1, 7
FLOOR, ROOF OR CEILING						
	60/60/60	90/90/90	120/120/120	180/180/180	240/240/240	Clause
Concrete—						
Prestressed		see 2(d)(ii) of this Specification				
Reinforced		see 2(d)(ii) of this Specification				

ANNEXURE TO TABLE 1

1. MORTAR, PLASTER AND PLASTER REINFORCEMENT

1.1 Mortar for masonry

Masonry units of ashlar, calcium silicate, concrete or fired clay (including terracotta blocks) must be laid in cement mortar or composition mortar complying with the relevant provisions of AS 3700.

1.2 Gypsum blocks

Gypsum blocks must be laid in gypsum-sand mortar or lime mortar.

1.3 Gypsum-sand mortar and plaster

Gypsum-sand mortar and gypsum-sand plaster must consist of either—

(a) not more than 3 parts by volume of sand to 1 part by volume of gypsum; or

(b) if lime putty is added, not more than 2.5 parts by volume of sand to 1 part by volume of gypsum and not more than 5% of lime putty by volume of the mixed ingredients.

1.4 Gypsum-perlite and gypsum-vermiculite plaster

Gypsum-perlite or gypsum-vermiculite plaster must be applied—

(a) in either one or 2 coats each in the proportions of 1 m^3 of perlite or vermiculite to 640 kg of gypsum if the *required* thickness of the plaster is not more than 25 mm; and

(b) in 2 coats if the *required* thickness is more than 25 mm, the first in the proportions of 1 m^3 of perlite or vermiculite to 800 kg of gypsum and the second in the proportions of 1 m^3 of perlite or vermiculite to 530 kg of gypsum.

1.5 Plaster of cement and sand or cement, lime and sand

Plaster prescribed in **Table 1** must consist of—

(a) cement and sand or cement, lime and sand; and

(b) may be finished with gypsum, gypsum-sand, gypsum-perlite or gypsum-vermiculite plaster or with lime putty.

1.6 Plaster reinforcement

If plaster used as fire protection on walls is more than 19 mm thick—

(a) it must be reinforced with expanded metal lath that—

(i) has a mass per unit area of not less than 1.84 kg/m^2; and

(ii) has not fewer than 98 meshes per metre; and

(iii) is protected against corrosion by galvanising or other suitable method; or

(b) it must be reinforced with 13 mm x 13 mm x 0.7 mm galvanised steel wire mesh, and

with the reinforcement must be securely fixed at a distance from the face of the wall of not less than 1/3 of the total thickness of the plaster.

2. ASHLAR STONE MASONRY

Ashlar masonry must not be used in a part of the building containing more than 2 *storeys*, and must not be of—

(a) aplite, granite, granodiorite, quartz dacite, quartz diorite, quartz porphyrite or quartz porphyry; or

(b) conglomerate, quartzite or sandstone; or

(c) chert or flint; or

(d) limestone or marble.

3. DIMENSIONS OF MASONRY

The thicknesses of masonry of calcium-silicate, concrete and fired clay are calculated as follows:

3.1 Solid units

For masonry in which the amount of perforation or coring of the units does not exceed 25% by volume (based on the overall rectangular shape of the unit) the thickness of the wall must be calculated from the manufacturing dimensions of the units and the specified thickness of the joints between them as appropriate.

3.2 Hollow units

For masonry in which the amount of perforation or coring of the units exceeds 25% by volume (based on the overall rectangular shape of the unit) the thickness of the wall must be calculated from the equivalent thicknesses of the units and the specified thickness of the joints between them as appropriate.

3.3 Equivalent thickness

The equivalent thickness of a masonry unit is calculated by dividing the net volume by the area of one vertical face.

4. * * * * *

This Clause has deliberately been left blank.

5. HEIGHT-TO-THICKNESS RATIO OF CERTAIN WALLS

The ratio of height between lateral supports to overall thickness of a wall of ashlar, no-fines concrete, unreinforced concrete, solid gypsum blocks, gypsum-perlite or gypsum-vermiculite plaster on metal lath and channel, must not exceed—

(a) 20 for a *loadbearing* wall; or

(b) 27 for a non-*loadbearing* wall.

6. INCREASE IN THICKNESS BY PLASTERING

6.1 Walls

If a wall of ashlar, solid gypsum blocks or concrete is plastered on both sides to an equal thickness, the thickness of the wall for the purposes of **Table 1** (but not for the purposes of **Annexure Clause 5**) may be increased by the thickness of the plaster on one side.

6.2 Columns

Where **Table 1** indicates that column-protection is to be plastered, the tabulated thicknesses are those of the principal material. They do not include the thickness of plaster which must be additional to the listed thickness of the material to which it is applied.

7. GYPSUM-PERLITE OR GYPSUM-VERMICULITE PLASTER ON METAL LATH

7.1 Walls

In walls fabricated of gypsum-perlite or gypsum-vermiculite plaster on metal lath and channel—

(a) the lath must be securely wired to each side of 19 mm x 0.44 kg/m steel channels (used as studs) spaced at not more than 400 mm centres; and

(b) the gypsum-perlite or gypsum-vermiculite plaster must be applied symmetrically to each exposed side of the lath.

7.2 Columns

For the fire protection of steel columns with gypsum-perlite or gypsum-vermiculite on metal lath—

(a) the lath must be fixed at not more than 600 mm centres vertically to steel furring channels, and—

  (i) if the plaster is to be 35 mm thick or more — at least 12 mm clear of the column; or

  (ii) if the plaster is to be less than 35 mm thick — at least 6 mm clear of the column; or

(b) the plaster may be applied to self-furring lath with furring dimples to hold it not less than 10 mm clear of the column, and

the thickness of the plaster must be measured from the back of the lath.

7.3 Beams

For the fire protection of steel beams with gypsum-perlite or gypsum-vermiculite on metal lath—

(a) the lath must be fixed at not more than 600 mm centres to steel furring channels and at least 20 mm clear of the steel; and

(b) the thickness of the plaster must be measured from the back of the lath.

8. EXPOSURE OF COLUMNS AND BEAMS

8.1 Columns

A column incorporated in or in contact on one or more sides with a wall of solid masonry or concrete at least 100 mm thick may be considered to be exposed to fire on no more than 3 sides.

8.2 Beams

A beam, open-web joist, girder or truss in direct and continuous contact with a concrete slab or a hollow block floor or roof may be considered to be exposed to fire on no more than 3 sides.

9. FILLING OF COLUMN SPACES

(a) The spaces between the fire-protective material and the steel (and any re-entrant parts of the column itself) must be filled solid with a fire-protective material like concrete, gypsum or grout.

(b) The insides of hollow sections, including pipes, need not be filled.

10. HOLLOW TERRACOTTA BLOCKS

The proportion of cored holes or perforations in a hollow terracotta block (based on the overall rectangular volume of the unit) must not exceed the following:

(a)	For blocks up to 75 mm thick	35%
(b)	For blocks more than 75 mm but not more than 100 mm thick	40%
(c)	For blocks more than 100 mm	50%

11. REINFORCEMENT FOR COLUMN AND BEAM PROTECTION

11.1 Masonry

Masonry of calcium-silicate, fired clay and concrete for the protection of steel columns must have steel-wire or mesh reinforcement in every second course and lapped at the corners.

11.2 Gypsum blocks and hollow terracotta blocks

Gypsum blocks and hollow terracotta blocks for the protection of steel columns must have steel-wire or mesh reinforcement in every course and lapped at corners.

11.3 Structural concrete and poured gypsum

If a steel column or a steel beam is to be protected with structural concrete or poured gypsum—

(a) the concrete or gypsum must be reinforced with steel-wire mesh or steel-wire binding placed about 20 mm from its outer surface, and—

(i) for concrete or gypsum less than 50 mm thick, the steel wire must be—

(A) at least 3.15 mm in diameter; and

(B) spaced at not more than 100 mm vertically; or

(ii) for concrete or gypsum not less than 50 mm thick, the steel wire must be either—

(A) of a diameter and spacing in accordance with (i); or

(B) at least 5 mm in diameter and spaced at not more than 150 mm vertically.

11.4 Gypsum-perlite or gypsum-vermiculite plaster sprayed to contour

(a) If a steel column or steel beam is protected with either gypsum-perlite or gypsum-vermiculite plaster sprayed to contour and the construction falls within the limits of **Table 11.4**, the plaster must be reinforced with—

(i) expanded metal lath complying with **Clause 1.6 of this Annexure**; or

(ii) galvanised steel wire mesh complying with **Clause 1.6 of this Annexure**.

(b) The reinforcement must be placed at a distance from the face of the plaster of at least 1/3 of the thickness of the plaster and must be securely fixed to the column or beam at intervals of not more than the relevant listing in **Table 11.4**.

(c) For the purposes of **Table 11.4**—

(i) "vertical" includes a surface at not more than 10° to the vertical; and

(ii) "horizontal" includes a surface at not more than 10° to the horizontal; and

(iii) "underside" means the underside of any horizontal or non-vertical surface.

Table 11.4 REINFORCEMENT OF GYPSUM-PERLITE OR GYPSUM-VERMICULITE PLASTER SPRAYED TO CONTOUR

Surface to be protected	Reinforcement required if smaller dimension of surface exceeds (mm)	Max spacing of fixings of the mesh to surface (mm)
Members with H or I cross-section:		
Vertical—	450	450
Non-vertical—	300	300
Underside—	300	300
Upper side of a horizontal surface—	Not required	
Members with other shapes:		
Vertical—	Any size	450
Non-vertical—	Any size	300
Underside—	Any size	300
Upper side of a horizontal surface—	Not required	

12. THICKNESS OF COLUMN AND BEAM PROTECTION

12.1 Measurement of thickness

The thickness of the fire protection to steel columns and steel beams (other than fire protection of gypsum-perlite or gypsum-vermiculite plaster sprayed on metal lath or sprayed to contour) is to be measured from the face or edge of the steel, from the face of a splice plate or from the outer part of a rivet or bolt, whichever is the closest to the outside of the fire-protective construction, except that—

(a) if the thickness of the fire protection is 40 mm or more, rivet heads may be disregarded; and

(b) if the thickness of the fire protection is 50 mm or more—

  (i) any part of a bolt (other than a high-tensile bolt) may be disregarded; and

  (ii) a column splice plate within 900 mm of the floor may encroach upon the fire protection by up to a 1/4 of the thickness of the fire protection; and

(c) the flange of a column or beam may encroach by up to 12 mm upon the thickness of the fire protection at right angles to the web if—

  (i) the column or beam is intended to have an FRL of 240/240/240 or 240/–/–; and

  (ii) the flange projects 65 mm or more from the web; and

  (iii) the thickness of the edge of the flange (inclusive of any splice plate) is not more than 40 mm.

SPECIFICATION A2.4 FIRE HAZARD PROPERTIES

1. Scope

This Specification sets out the procedures for—

(a) determining the *fire hazard properties* of assemblies tested to AS/NZS 1530.3; and

(b) predicting a material's *group number* and *smoke growth rate index* ($SMOGRA_{RC}$) for the purposes of **Specification C1.10**.

2. Assemblies

2.1 General requirement

The *fire hazard properties* of assemblies and their ability to screen their core materials as *required* under **Specification C1.10** must be determined by testing in accordance with this Clause.

2.2 Form of test

Tests must be carried out in accordance with—

(a) for the determination of the *Spread-of-Flame Index* and *Smoke-Developed Index* — AS/NZS 1530.3; and

(b) for the determination of the ability to prevent ignition and to screen its core material from free air — AS 1530.4.

2.3 Test specimens

Test specimens must incorporate—

(a) all types of joints; and

(b) all types of perforations, recesses or the like for pipes, light switches or other fittings, which are proposed to be used for the member or assembly of members in the building.

2.4 Concession

Clause 2.3 does not apply to joints, perforations, recesses or the like that are larger than those in the proposed application and have already been tested in the particular form of construction concerned and found to comply with the conditions of the test.

2.5 Smaller specimen permitted

A testing laboratory may carry out the test specified in **Clause 2.2(b)** at pilot scale if a specimen (which must be not less than 900 mm x 900 mm) will adequately represent the proposed construction in the building, but the results of that test do not apply to construction larger than limits defined by the laboratory conducting the pilot examination.

3. Predicting a material's group number

For a material tested to AS/NZS 3837, the material's *group number* must be determined in accordance with the following:

(a) Data must be in the form of time and rate of heat release pairs for the duration of the test. The time interval between pairs should not be more than 5 seconds. The end of the test (t_f) is determined as defined in AS/NZS 3837.

(b) At least three replicate specimens must be tested. The following procedure must be applied separately to each specimen:

(i) Determine time to ignition (t_{ig}). Time to ignition is defined as the time (in seconds) when the rate of heat release reaches or first exceeds a value of 50 kW/m^2.

(ii) Calculate the Ignitability Index (I_{ig}) expressed in reciprocal minutes.

$$I_{ig} = \frac{60}{t_{ig}}$$

(iii) Calculate the following two rates of heat release indices.

$$I_{Q1} = \int_{t_i}^{t_f} \left[\frac{q''(t)}{(t - t_{ig})^{0.34}} \right] \qquad I_{Q2} = \int_{t_i}^{t_f} \left[\frac{q''(t)}{(t - t_{ig})^{0.93}} \right]$$

t = time (seconds),

$q''(t)$ = rate of heat release (kW/m^2) at time t

These definite integral expressions represent the area under a curve from the ignition time until the end of the test, where the parameter $q''(t)/(t - t_{ig})^m$ is plotted on the vertical axis and time (t) is plotted on the horizontal axis.

(iv) Calculate the following three integral limits:

$I_{Q,10min} = 6800 - 540I_{ig}$

$I_{Q,2min} = 2475 - 165I_{ig}$

$I_{Q,12min} = 1650 - 165I_{ig}$

(v) Classify the material in accordance with **Table 3**:

Table 3 CLASSIFICATION OF MATERIALS

If $I_{Q1} > I_{Q,10\ min}$ and $I_{Q2} > I_{Q,2\ min}$	the material is a Group 4 material
If $I_{Q1} > I_{Q,10\ min}$ and $I_{Q2} \leq I_{Q,2\ min}$	the material is a Group 3 material
If $I_{Q1} \leq I_{Q,10\ min}$ and $I_{Q2} > I_{Q,12\ min}$	the material is a Group 2 material
If $I_{Q1} \leq I_{Q,10\ min}$ and $I_{Q2} \leq I_{Q,12\ min}$	the material is a Group 1 material

(vi) Repeat steps 1 to 5 above for each replicate specimen tested. Where a different classification group is obtained for different specimens tested, then

the highest (worst) classification for any specimen must be taken as the final classification for that material.

4. Predicting a material's smoke growth rate index ($SMOGRA_{RC}$)

(a) Measure the instantaneous rate of light-obscuring smoke R_{inst} expressed in square metres per second (m^2/s) in the exhaust duct at not more than 6 second intervals in the AS ISO 9705 room test.

(b) Determine the 60 second running average (R_{60}) at time t. The result is the average rate of light-obscuring smoke over the period t-30 to t+30 seconds (in m^2/s). This may also be expressed mathematically as:

$$R_{60} = \frac{1}{60} \int_{t-30}^{t+30} R_{inst}\,dt$$

(c) Find the time (in seconds) at which the maximum value of the 60 second running average occurs (t_{60}).

(d) Calculate the $SMOGRA_{RC}$ index (in m^2/s^2 x 1000)

$$SMOGRA_{RC} = \frac{1000R_{60}}{t_{60}}$$

The $SMOGRA_{RC}$ index is based on the results of a single test.

SECTION B

STRUCTURE

B1 Structural Provisions

SECTION B CONTENTS

PART B1 STRUCTURAL PROVISIONS

OBJECTIVE

BO1

The *Objective* of this Part is to—

(a) safeguard people from injury caused by structural failure; and

(b) safeguard people from loss of amenity caused by structural behaviour; and

(c) protect *other property* from physical damage caused by structural failure; and

(d) safeguard people from injury that may be caused by failure of, or impact with, glazing.

FUNCTIONAL STATEMENT

BF1.1

A building or structure is to withstand the combination of loads and other actions to which it may be reasonably subjected.

BF1.2

Glazing is to be installed in a building to avoid undue risk of injury to people.

PERFORMANCE REQUIREMENT

BP1.1

(a) A building or structure, during construction and use, with appropriate degrees of reliability, must—

(i) perform adequately under all reasonably expected design actions; and

(ii) withstand extreme or frequently repeated design actions; and

(iii) be designed to sustain local damage, with the structural system as a whole remaining stable and not being damaged to an extent disproportionate to the original local damage; and

(iv) avoid causing damage to *other properties*,

by resisting the actions to which it may reasonably expect to be subjected.

(b) The actions to be considered to satisfy **(a)** include but are not limited to—

(i) permanent actions (dead loads); and

(ii) imposed actions (live loads arising from occupancy and use); and

(iii) wind action; and

(iv) earthquake action; and

(v) snow action; and

(vi) liquid pressure action; and

(vii) ground water action; and

(viii) rainwater action (including ponding action); and

(ix) earth pressure action; and

(x) differential movement; and

(xi) time dependent effects (including creep and shrinkage); and

(xii) thermal effects; and

(xiii) ground movement caused by—

(A) swelling, shrinkage or freezing of the subsoil; and

(B) landslip or subsidence; and

(C) siteworks associated with the building or structure; and

(xiv) *construction activity actions*; and

(xv) termite actions.

BP1.2

The structural resistance of materials and forms of construction must be determined using five percentile characteristic material properties with appropriate allowance for—

(a) known construction activities; and

(b) type of material; and

(c) characteristics of the site; and

(d) the degree of accuracy inherent in the methods used to assess the structural behaviour; and

(e) action effects arising from the differential settlement of foundations, and from restrained dimensional changes due to temperature, moisture, shrinkage, creep and similar effects.

BP1.3

Glass installations that are at risk of being subjected to human impact must have glazing that—

(a) if broken on impact, will break in a way that is not likely to cause injury to people; and

(b) resists a reasonably foreseeable human impact without breaking; and

(c) is protected or marked in a way that will reduce the likelihood of human impact.

PART B1 STRUCTURAL PROVISIONS

Deemed-to-Satisfy Provisions

B1.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirement* **BP1.1** to **BP1.3** are satisfied by complying with **B1.1**, **B1.2**, **B1.4** and **B1.5**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **B1.1**, **B1.2**, **B1.4** and **B1.5**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

B1.1 Resistance to actions

The resistance of a building or structure must be greater than the most critical action effect resulting from different combinations of actions, where—

(a) the most critical action effect on a building or structure is determined in accordance with **B1.2** and the general design procedures contained in AS/NZS 1170.0; and

(b) the resistance of a building or structure is determined in accordance with **B1.4**.

B1.2 Determination of individual actions

The magnitude of individual actions must be determined in accordance with the following:

(a) Permanent actions:

  (i) the design or known dimensions of the building or structure; and

  (ii) the unit weight of the construction; and

  (iii) AS/NZS 1170.1.

(b) Imposed actions:

  (i) the known loads that will be imposed during the occupation or use of the building or structure; and

  (ii) *construction activity actions*; and

  (iii) AS/NZS 1170.1.

(c) Wind, snow and ice and earthquake actions:

  (i) the applicable annual probability of design event for safety, determined by—

    (A) assigning the building or structure an Importance Level in accordance with **Table B1.2a**; and

    (B) determining the corresponding annual probability of exceedance in accordance with **Table B1.2b**; and

  (ii)

    (A) AS/NZS 1170.2 (2002); or

B STRUCTURE

Deemed-to-Satisfy Provisions

(B) AS/NZS 1170.2 (2011) except that clause 2.3 Design Wind Speed and Figure 3.1(A) Wind Regions do not apply and are replaced by clause 2.3 and Figure 3.1 of AS/NZS 1170.2 (2002); and

(iii) AS/NZS 1170.3 and AS 1170.4 as appropriate; and

(iv) in cyclonic areas, metal roof cladding, its connections and immediate supporting members must comply with **Specification B1.2**; and

(v) for the purposes of **(iv)**, cyclonic areas are those determined as being located in wind regions C and D in accordance with AS/NZS 1170.2 (2002).

(d) Actions not covered in **(a)**, **(b)** and **(c)** above:

(i) the nature of the action; and

(ii) the nature of the building or structure; and

(iii) the Importance Level of the building or structure determined in accordance with **Table B1.2a**; and

(iv) AS/NZS 1170.1.

(e) For the purposes of **(d)** the actions include but are not limited to—

(i) liquid pressure action; and

(ii) ground water action; and

(iii) rainwater action (including ponding action); and

(iv) earth pressure action; and

(v) differential movement; and

(vi) time dependent effects (including creep and shrinkage); and

(vii) thermal effects; and

(viii) ground movement caused by—

(A) swelling, shrinkage or freezing of the subsoil; and

(B) landslip or subsidence; and

(C) *siteworks* associated with the building or structure; and

(ix) *construction activity actions*.

Table B1.2a Importance Levels of Buildings and Structures

Importance Level	Building Types
1	Buildings or structures presenting a low degree of hazard to life and *other property* in the case of failure.
2	Buildings or structures not included in Importance Levels 1, 3 and 4.
3	Buildings or structures that are designed to contain a large number of people.

Deemed-to-Satisfy Provisions

Table B1.2a Importance Levels of Buildings and Structures (Continued)

Importance Level	Building Types
4	Buildings or structures that are essential to post-disaster recovery or associated with hazardous facilities.

Table B1.2b Design Events for Safety

Importance Level	Annual probability of exceedance			
	Wind		Snow	Earthquake
	Non-cyclonic	Cyclonic		
1	1:100	1:200	1:100	1:250
2	1:500	1:500	1:150	1:500
3	1:1000	1:1000	1:200	1:1000
4	1:2000	1:2000	1:250	1:1500

B1.3 * * * * *

This clause has deliberately been left blank

B1.4 Determination of structural resistance of materials and forms of construction

The structural resistance of materials and forms of construction must be determined in accordance with the following, as appropriate:

(a) Masonry (including masonry-veneer, unreinforced masonry and reinforced masonry): AS 3700.

(b) Concrete construction (including reinforced and prestressed concrete): AS 3600.

(c) Steel construction—

  (i) Steel structures: AS 4100.

  (ii) Cold-formed steel structures: AS/NZS 4600.

  (iii) Residential and low-rise steel framing: NASH Standard.

(d) Composite steel and concrete: AS 2327.1.

(e) Aluminium construction: AS/NZS 1664.1 or AS/NZS 1664.2.

(f) Timber construction:

  (i) Design of timber structures: AS 1720.1.

  (ii) * * * * *

  (iii) Timber structures: AS 1684 Part 2, Part 3 or Part 4.

Qld B1.4(f)(iv)

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(g) Piling: AS 2159.

(h) Glazed assemblies:

(i) The following glazed assemblies in an *external wall* must comply with AS 2047:

(A) Windows excluding those listed in (ii).

(B) Sliding doors with a frame.

(C) Adjustable louvres.

(D) Shopfronts.

(E) Window walls with one piece framing.

(ii) All glazed assemblies not covered by (i) and the following glazed assemblies must comply with AS 1288:

(A) All glazed assemblies not in an *external wall*.

(B) Hinged doors, including French doors and bi-fold doors.

(C) Revolving doors.

(D) Fixed louvres.

(E) Skylights, roof lights and windows in other than the vertical plane.

(F) Sliding doors without a frame.

(G) Shopfront doors.

(H) Windows constructed on site and architectural one-off windows, which are not design tested in accordance with AS 2047.

(I) Second-hand windows, re-used windows, recycled windows and replacement windows.

(J) Heritage windows.

(K) Glazing used in balustrades and sloping overhead glazing.

NT B1.4(i)

(i) Termite Risk Management: Where a *primary building element* is subject to attack by subterranean termites: AS 3660.1, and—

(i) for the purposes of this provision, a *primary building element* consisting entirely of, or a combination of, any of the following materials is considered not subject to termite attack:

(A) Steel, aluminium or other metals.

(B) Concrete.

(C) Masonry.

(D) Fibre-reinforced cement.

(E) Timber — naturally termite resistant in accordance with Appendix C of AS 3660.1.

(F) Timber — preservative treated in accordance with Appendix D of AS 3660.1; and

(ii) a durable notice must be permanently fixed to the building in a prominent location, such as a meter box or the like, indicating—

(A) the method of termite risk management; and

(B) the date of installation of the system; and

(C) where a chemical barrier is used, its life expectancy as listed on the National Registration Authority label; and

(D) the installer's or manufacturer's recommendations for the scope and frequency of future inspections for termite activity.

(j) Roof construction (except in cyclone areas):

(i) Plastic sheeting: AS/NZS 1562.3, AS/NZS 4256 Parts 1, 2, 3 and 5.

(ii) Roofing tiles: AS 2049, AS 2050.

(iii) Cellulose cement corrugated sheets: AS/NZS 2908.1 with safety mesh installed in accordance with AS/NZS 1562.3 clause 2.4.3.2 except for sub clause (g) for plastic sheeting.

(iv) Metal roofing: AS 1562.1.

(v) Asphalt shingles: ASTM D3018-90, Class A.

(k) Particleboard structural flooring: AS 1860.2.

(l) * * * * *

(m) Lift *shafts* which are not *required* to have an FRL: AS 1735.2 Clause 11.1.2.

B1.5 Structural Software

(a) Structural software used in computer aided design of a building or structure, that uses design criteria based on the *Deemed-to-Satisfy Provisions* of the BCA, including its referenced documents, must comply with the ABCB Protocol for Structural Software.

(b) The requirements of **(a)** only apply to structural software used to design steel or timber trussed roof and floor systems and framed building systems for buildings within the following geometrical limits:

(i) The distance from ground level to the underside of eaves must not exceed 6 m.

(ii) The distance from ground level to the highest point of the roof, neglecting chimneys must not exceed 8.5 m.

(iii) The building width including roofed verandahs, excluding eaves, must not exceed 16 m.

(iv) The building length must not exceed five times the building width.

(v) The roof pitch must not exceed 35 degrees.

(c) The requirements of **(a)** do not apply to design software for individual frame members such as electronic tables similar to those provided in AS 1684.

SPECIFICATION B1.2 DESIGN OF BUILDINGS IN CYCLONIC AREAS

Deemed-to-Satisfy Provisions

1. Scope

This specification contains requirements for the design of buildings in cyclonic areas in addition to the requirements of AS/NZS 1170.2 (2002) or AS/NZS 1170.2 (2011) except that clause 2.3 Design Wind Speed and Figure 3.1(A) Wind Regions do not apply and are replaced by clause 2.3 and Figure 3.1 of AS/NZS 1170.2 (2002).

For the purposes of **Specification B1.2**, cyclonic areas are those determined as being located in wind regions C and D in accordance with AS/NZS 1170.2 (2002).

2. Roof Cladding

Test for strength - Metal roof cladding, its connections and immediate supporting members must be capable of remaining in position notwithstanding any permanent distortion, fracture or damage that might occur in the sheet or fastenings under the pressure sequences A to G defined in **Table 1**.

TABLE 1 LOW-HIGH-LOW PRESSURE SEQUENCE

Sequence	Number of cycles	Load
A	4500	0 to 0.45 Pt
B	600	0 to 0.6 Pt
C	80	0 to 0.8 Pt
D	1	0 to 1.0 Pt
E	80	0 to 0.8 Pt
F	600	0 to 0.6 Pt
G	4500	0 to 0.45 Pt

Note:

1. Pt is the ultimate limit state wind pressure on internal and external surfaces as determined in accordance with AS/NZS 1170.2, modified by an appropriate factor for variability, as determined in accordance with Table B1 of AS/NZS 1170.0.
2. The rate of load cycling must be less than 3Hz.
3. The single load cycle (sequence D) must be held for a minimum of 10 seconds.

NT Specification B1.2 Clause NT3 — NT4.

SECTION C

FIRE RESISTANCE

SECTION C CONTENTS

C3.1 Application of Part
C3.2 Protection of openings in external walls
C3.3 Separation of external walls and associated openings in different fire compartments
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C3.5 Doorways in fire walls
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C3.7 Protection of doorways in horizontal exits
C3.8 Openings in fire-isolated exits
C3.9 Service penetrations in fire-isolated exits
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C3.11 Bounding construction: Class 2, 3 and 4 buildings
C3.12 Openings in floors and ceilings for services
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C3.16 Construction joints
C3.17 Columns protected with lightweight construction to achieve an FRL

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Specification C1.1 Fire-Resisting Construction
Specification C1.8 Structural Tests for Lightweight Construction
Specification C1.10 Fire Hazard Properties
Specification C1.11 Performance of External Walls in Fire
Specification C2.5 Smoke-Proof Walls in Health-Care and Aged Care Buildings
Specification C3.4 Fire Doors, Smoke Doors, Fire Windows and Shutters
Specification C3.15 Penetration of Walls, Floors and Ceilings by Services

SECTION C FIRE RESISTANCE

OBJECTIVE

CO1

The *Objective* of this Section is to—

(a) safeguard people from illness or injury due to a fire in a building; and

(b) safeguard occupants from illness or injury while evacuating a building during a fire; and

(c) facilitate the activities of emergency services personnel; and

(d) avoid the spread of fire between buildings; and

(e) protect *other property* from physical damage caused by structural failure of a building as a result of fire.

FUNCTIONAL STATEMENTS

CF1

A building is to be constructed to maintain structural stability during fire to—

(a) allow occupants time to evacuate safely; and

(b) allow for *fire brigade* intervention; and

(c) avoid damage to *other property*.

CF2

A building is to be provided with safeguards to prevent fire spread—

(a) so that occupants have time to evacuate safely without being overcome by the effects of fire; and

(b) to allow for *fire brigade* intervention; and

(c) to *sole-occupancy* units providing sleeping accommodation; and

Application:

CF2(c) only applies to a Class 2 or 3 building or Class 4 part.

(d) to adjoining *fire compartments*; and

(e) between buildings.

PERFORMANCE REQUIREMENTS

CP1

A building must have elements which will, to the degree necessary, maintain structural stability during a fire appropriate to—

(a) the function or use of the building; and

(b) the *fire load*; and

(c) the potential *fire intensity*; and

(d) the *fire hazard*; and

(e) the height of the building; and

(f) its proximity to *other property*; and

(g) any active *fire safety systems* installed in the building; and

(h) the size of any *fire compartment*; and

(i) *fire brigade* intervention; and

(j) other elements they support; and

(k) the *evacuation time*.

CP2

(a) A building must have elements which will, to the degree necessary, avoid the spread of fire—

(i) to *exits*; and

(ii) to *sole-occupancy units* and *public corridors*; and

Application:

CP2(a)(ii) only applies to a Class 2 or 3 building or Class 4 part.

(iii) between buildings; and

(iv) in a building.

(b) Avoidance of the spread of fire referred to in **(a)** must be appropriate to—

(i) the function or use of the building; and

(ii) the *fire load*; and

(iii) the potential *fire intensity*; and

(iv) the *fire hazard*; and

(v) the number of *storeys* in the building; and

(vi) its proximity to *other property*; and

(vii) any active *fire safety systems* installed in the building; and

(viii) the size of any *fire compartment*; and

(ix) *fire brigade* intervention; and

(x) other elements they support; and

(xi) the *evacuation time*.

CP3

A building must be protected from the spread of fire and smoke to allow sufficient time for the orderly evacuation of the building in an emergency.

Application:

CP3 only applies to—

(a) a *patient care area* of a Class 9a *health-care building*; and

(b) a Class 9c *aged care building*.

CP4

To maintain tenable conditions during occupant evacuation, a material and an assembly must, to the degree necessary, resist the spread of fire and limit the generation of smoke and heat, and any toxic gases likely to be produced, appropriate to—

(a) the *evacuation time*; and

(b) the number, mobility and other characteristics of occupants; and

(c) the function or use of the building; and

(d) any active *fire safety systems* installed in the building.

Application:

CP4 applies to linings, materials and assemblies in a Class 2 to 9 building.

CP5

A concrete *external wall* that could collapse as a complete panel (eg. tilt-up and pre-cast concrete) must be designed so that in the event of fire within the building the likelihood of outward collapse is avoided.

Limitation:

CP5 does not apply to a building having more than two *storeys* above ground level.

CP6

A building must have elements, which will, to the degree necessary, avoid the spread of fire from service equipment having—

(a) a high *fire hazard*; or

(b) a potential for explosion resulting from a high *fire hazard*.

CP7

A building must have elements, which will, to the degree necessary, avoid the spread of fire so that emergency equipment provided in a building will continue to operate for a period of time necessary to ensure that the intended function of the equipment is maintained during a fire.

CP8

Any building element provided to resist the spread of fire must be protected, to the degree necessary, so that an adequate level of performance is maintained—

(a) where openings, construction joints and the like occur; and

(b) where penetrations occur for building services.

CP9

Access must be provided to and around a building, to the degree necessary, for *fire brigade* vehicles and personnel to facilitate *fire brigade* intervention appropriate to—

(a) the function or use of the building; and

(b) the *fire load*; and

(c) the potential *fire intensity*; and

(d) the *fire hazard*; and

(e) any active *fire safety systems* installed in the building; and

(f) the size of any *fire compartment*.

VERIFICATION METHODS

CV1

Compliance with **CP2(a)(iii)** to avoid the spread of fire between buildings on adjoining allotments is verified when it is calculated that—

(a) a building will not cause heat flux in excess of those set out in column 2 of **Table CV1** at locations within the boundaries of an adjoining property set out in column 1 of **Table CV1** where another building may be constructed; and

(b) when located at the distances from the allotment boundary set out in column 1 of **Table CV1**, a building is capable of withstanding the heat flux set out in column 2 of **Table CV1** without ignition.

Table CV1

Column 1	Column 2
Location	Heat Flux (kW/m^2)
On boundary	80
1 m from boundary	40
3 m from boundary	20
6 m from boundary	10

CV2

Compliance with **CP2(a)(iii)** to avoid the spread of fire between buildings on the same allotment is verified when it is calculated that a building—

(a) is capable of withstanding the heat flux set out in column 2 of **Table CV2** without ignition; and

(b) will not cause heat flux in excess of those set out in column 2 of **Table CV2**,

when the distance between the buildings is as set out in column 1 of **Table CV2**.

Table CV2

Column 1	Column 2
Distance between buildings	Heat Flux (kW/m^2)
0 m	80
2 m	40
6 m	20
12 m	10

PART C1 FIRE RESISTANCE AND STABILITY

Deemed-to-Satisfy Provisions

C1.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **CP1** to **CP9** are satisfied by complying with—

(i) **C1.1** to **C1.12**, **C2.1** to **C2.14** and **C3.1** to **C3.17**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **C1.1** to **C1.12**, **C2.1** to **C2.14** and **C3.1** to **C3.17**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

C1.1 Type of construction required

(a) The minimum Type of *fire-resisting construction* of a building must be that specified in **Table C1.1** and **Specification C1.1**, except as allowed for—

(i) certain Class 2, 3 or 9c buildings in **C1.5**; and

(ii) a Class 4 part of a building located on the top *storey* in **C1.3(b)**; and

(iii) *open spectator stands* and indoor sports stadiums in **C1.7**.

(iv) * * * * *

SA C1.1(a)(v)

(b) Type A construction is the most fire-resistant and Type C the least fire-resistant of the Types of construction.

Table C1.1 TYPE OF CONSTRUCTION REQUIRED

Rise in storeys	Class of building	
	2, 3, 9	5, 6, 7, 8
4 OR MORE	A	A
3	A	B
2	B	C
1	C	C

C FIRE RESISTANCE

SA C1.1(c) and (d)

C1.2 Calculation of rise in storeys

(a) The *rise in storeys* is the sum of the greatest number of *storeys* at any part of the *external walls* of the building and any *storeys* within the roof space—

(i) above the finished ground next to that part; or

(ii) if part of the *external wall* is on the boundary of the allotment, above the natural ground level at the relevant part of the boundary.

(b) A *storey* is not counted if—

(i) it is situated at the top of the building and contains only heating, ventilating or lift equipment, water tanks, or similar service units or equipment; or

(ii) it is situated partly below the finished ground and the underside of the ceiling is not more than 1 m above the average finished level of the ground at the *external wall*, or if the *external wall* is more than 12 m long, the average for the 12 m part where the ground is lowest.

(c) In a Class 7 or 8 building, a *storey* that has an average internal height of more than 6 m is counted as—

(i) one *storey* if it is the only *storey* above the ground; or

(ii) 2 *storeys* in any other case.

(d) For the purposes of calculating the *rise in storeys* of a building—

(i) a *mezzanine* is regarded as a *storey* in that part of the building in which it is situated if its *floor area* is more than 200 m^2 or more than 1/3 of the *floor area* of the room, whichever is the lesser; and

(ii) two or more *mezzanines* are regarded as a *storey* in that part of the building in which they are situated if they are at or near the same level and have an aggregate *floor area* more than 200 m^2 or more than 1/3 of the *floor area* of the room, whichever is the lesser.

C1.3 Buildings of multiple classification

(a) In a building of multiple classifications, the Type of construction *required* for the building is the most *fire-resisting* Type resulting from the application of **Table C1.1** on the basis that the classification applying to the top *storey* applies to all *storeys*.

(b) In a building containing a Class 4 part on the top *storey*, for the purpose of **(a)**, the classification applying to the top *storey* must be—

(i) when the Class 4 part occupies the whole of the top *storey*, the classification applicable to the next highest *storey*; or

(ii) when the Class 4 part occupies part of the top *storey*, the classification applicable to the adjacent part.

Deemed-to-Satisfy Provisions

C1.4 Mixed types of construction

A building may be of mixed Types of construction where it is separated in accordance with **C2.7** and the Type of construction is determined in accordance with **C1.1** or **C1.3**.

C1.5 Two storey Class 2, 3 or 9c buildings

A building having a *rise in storeys* of 2 may be of Type C construction if—

(a) it is a Class 2 or 3 building or a mixture of these classes and each *sole-occupancy unit* has—

(i) access to at least 2 *exits*; or

(ii) its own direct access to a road or *open space*.

(b) it is a Class 9c *aged care building* protected throughout with a sprinkler system complying with **Specification E1.5** and complies with the maximum compartment size specified in **Table C2.2** for Type C construction.

C1.6 Class 4 parts of buildings

For the Type of construction *required* by **C1.3**, a Class 4 part of a building requires the same FRL for building elements and the same construction separating the Class 4 part from the remainder of the building as a Class 2 part in the same Type of construction.

C1.7 Open spectator stands and indoor sports stadiums

(a) An *open spectator stand* or indoor sports stadium may be of Type C construction and need not comply with the other provisions of this Part if it contains not more than 1 tier of seating, is of *non-combustible* construction, and has only changing rooms, sanitary facilities or the like below the tiered seating.

(b) In **(a)**, one tier of seating means numerous rows of tiered seating incorporating cross-overs but within one viewing level.

C1.8 Lightweight construction

(a) *Lightweight construction* must comply with **Specification C1.8** if it is used in a wall system—

(i) that is *required* to have an FRL; or

(ii) for a lift *shaft*, stair *shaft* or service *shaft* or an *external wall* bounding a *public corridor* including a non *fire-isolated passageway* or non *fire-isolated ramp*, in a spectator stand, sports stadium, cinema or theatre, railway station, bus station or airport terminal.

(b) If *lightweight construction* is used for the *fire-resisting* covering of a steel column or the like, and if—

(i) the covering is not in continuous contact with the column, then the void must be filled solid, to a height of not less than 1.2 m above the floor to prevent indenting; and

(ii) the column is liable to be damaged from the movement of vehicles, materials or equipment, then the covering must be protected by steel or other suitable material.

C1.9 * * * * *

This clause has deliberately been left blank.

C1.10 Fire Hazard Properties

(a) The *fire hazard properties* of the following linings, materials and assemblies in a Class 2 to 9 building must comply with **Specification C1.10**:

(i) Floor linings and floor coverings.

(ii) Wall linings and ceiling linings.

(iii) Air-handling ductwork.

(iv) Lift cars.

NSW C1.10(a)(v)

(v) In Class 9b buildings used as a theatre, public hall or the like—

(A) fixed seating in the audience area or auditorium; and

(B) a proscenium curtain *required* by **Specification H1.3**.

(vi) Escalators, moving walkways and non-*required* non *fire-isolated stairways* or pedestrian ramps subject to **Specification D1.12**.

(vii) *Sarking-type materials*.

(viii) Attachments to floors, ceilings, internal walls and the internal linings of external walls.

(ix) Other materials including insulation materials other than *sarking-type materials*.

NSW C1.10(b)

(b) Paint or fire-retardant coatings must not be used to make a substrate comply with the *required fire hazard properties*.

(c) The requirements of **(a)** do not apply to a material or assembly if it is—

(i) plaster, cement render, concrete, terrazzo, ceramic tile or the like; or

(ii) a *fire-protective covering*; or

(iii) a timber-framed *window*; or

(iv) a solid timber handrail or skirting; or

(v) a timber-faced solid-core door or timber-faced fire door; or

(vi) an electrical switch, socket-outlet, cover plate or the like; or

(vii) a material used for—

Deemed-to-Satisfy Provisions

(A) a roof insulating material applied in continuous contact with a substrate; or

(B) an adhesive; or

(C) a damp-proof course, flashing, caulking, sealing, ground moisture barrier, or the like; or

(viii) a paint, varnish, lacquer or similar finish, other than nitro-cellulose lacquer; or

(ix) a clear or translucent roof light of glass fibre reinforced polyester if—

(A) the roof in which it is installed forms part of a single *storey* building *required* to be Type C construction; and

(B) the material is used as part of the roof covering; and

(C) it is not closer than 1.5 m from another roof light of the same type; and

(D) each roof light is not more than 14 m^2 in area; and

(E) the area of the roof lights per 70 m^2 of roof surface is not more than 14 m^2; or

(x) a face plate or neck adaptor of supply and return air outlets of an air handling system; or

(xi) a face plate or diffuser plate of light fitting and emergency *exit* signs and associated electrical wiring and electrical components; or

(xii) a joinery unit, cupboard, shelving, or the like; or

NSW C1.10(c)(xiii)

(xiii) an attached non-building fixture and fitting such as—

(A) a curtain, blind, or similar decor, other than a proscenium curtain *required* by **Specification H1.3**; and

(B) a whiteboard, *window* treatment or the like; or

(xiv) any other material that does not significantly increase the hazards of fire.

C1.11 Performance of external walls in fire

Concrete *external walls* that could collapse as complete panels (eg tilt-up and pre-cast concrete), in a building having a *rise in storeys* of not more than 2, must comply with **Specification C1.11**.

C1.12 Non-combustible materials

The following materials, though *combustible* or containing *combustible* fibres, may be used wherever a *non-combustible* material is *required*:

(a) Plasterboard.

(b) Perforated gypsum lath with a normal paper finish.

(c) Fibrous-plaster sheet.

(d) Fibre-reinforced cement sheeting.

Deemed-to-Satisfy Provisions

(e) Pre-finished metal sheeting having a *combustible* surface finish not exceeding 1 mm thickness and where the *Spread-of-Flame Index* of the product is not greater than 0.

(f) Bonded laminated materials where—

(i) each laminate is *non-combustible*; and

(ii) each adhesive layer does not exceed 1 mm in thickness; and

(iii) the total thickness of the adhesive layers does not exceed 2 mm; and

(iv) the *Spread-of-Flame Index* and the *Smoke-Developed Index* of the laminated material as a whole does not exceed 0 and 3 respectively.

PART C2 COMPARTMENTATION AND SEPARATION

Deemed-to-Satisfy Provisions

C2.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **CP1** to **CP9** are satisfied by complying with—

(i) **C1.1** to **C1.12**, **C2.1** to **C2.14** and **C3.1** to **C3.17**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **C1.1** to **C1.12**, **C2.1** to **C2.14** and **C3.1** to **C3.17**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

C2.1 Application of Part

(a) **C2.2**, **C2.3** and **C2.4** do not apply to a *carpark* provided with a sprinkler system complying with **Specification E1.5**, an *open-deck carpark* or an *open spectator stand*.

(b) **C2.12(a)(v)** does not apply to a Class 8 *electricity network substation*.

C2.2 General floor area and volume limitations

(a) The size of any *fire compartment* or *atrium* in a Class 5, 6, 7, 8 or 9 building must not exceed the relevant maximum *floor area* nor the relevant maximum volume set out in **Table C2.2** and **C2.5** except as permitted in **C2.3**.

(b) A part of a building which contains only heating, ventilating, or lift equipment, water tanks, or similar service units is not counted in the *floor area* or volume of a *fire compartment* or *atrium* if it is situated at the top of the building.

(c) In a building containing an *atrium*, the part of the *atrium well* bounded by the perimeter of the openings in the floors and extending from the level of the first floor above the *atrium* floor to the roof covering is not counted in the volume of the *atrium* for the purposes of this clause.

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Table C2.2 MAXIMUM SIZE OF FIRE COMPARTMENTS OR ATRIA

Classification		Type of construction of building		
		Type A	Type B	Type C
5, 9b or 9c *aged care building*	max *floor area*—	8 000 m^2	5 500 m^2	3 000 m^2
	max volume—	48 000 m^3	33 000 m^3	18 000 m^3
6, 7, 8 or 9a (except for *patient care areas*)	max *floor area*—	5 000 m^2	3 500 m^2	2 000 m^2
	max volume—	30 000 m^3	21 000 m^3	12 000 m^3

Note: See **C2.5** for maximum size of compartments in *patient care areas* in Class 9a *health care buildings*.

C2.3 Large isolated buildings

The size of a *fire compartment* in a building may exceed that specified in **Table C2.2** where—

(a) the building does not exceed 18 000 m^2 in *floor area* nor exceed 108 000 m^3 in volume, if—

(i) the building is Class 7 or 8 and—

(A) contains not more than 2 *storeys*; and

(B) is provided with open space complying with **C2.4(a)** not less than 18 m wide around the building; or

(ii) the building is Class 5 to 9 and is—

(A) protected throughout with a sprinkler system complying with **Specification E1.5**; and

(B) provided with a perimeter vehicular access complying with **C2.4(b)**; or

(b) the building is Class 5 to 9 and exceeds 18 000 m^2 in *floor area* or 108 000 m^3 in volume, if it is—

(i) protected throughout with a sprinkler system complying with **Specification E1.5**; and

(ii) provided with a perimeter vehicular access complying with **C2.4(b)**; or

(c) there is more than one building on the allotment and—

(i) each building complies with **(a)** or **(b)**; or

(ii) if the buildings are closer than 6 m to each other they are regarded as one building and collectively comply with **(a)** or **(b)**.

C2.4 Requirements for open spaces and vehicular access

(a) An open space *required* by **C2.3** must—

(i) be wholly within the allotment except that any road, river, or public place adjoining the allotment, but not the farthest 6 m of it may be included; and

(ii) include vehicular access in accordance with **(b)**; and

(iii) not be used for the storage or processing of materials; and

(iv) not be built upon, except for guard houses and service structures (such as electricity substations and pump houses) which may encroach upon the width of the space if they do not unduly impede fire-fighting at any part of the perimeter of the allotment or unduly add to the risk of spread of fire to any building on an adjoining allotment.

(b) Vehicular access *required* by this Part—

(i) must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building; and

(ii) must have a minimum unobstructed width of 6 m with no part of its furthest boundary more than 18 m from the building and in no part of the 6 m width be built upon or used for any purpose other than vehicular or pedestrian movement; and

(iii) must provide reasonable pedestrian access from the vehicular access to the building; and

(iv) must have a load bearing capacity and unobstructed height to permit the operation and passage of *fire brigade* vehicles; and

(v) must be wholly within the allotment except that a public road complying with **(i)**, **(ii)**, **(iii)** and **(iv)** may serve as the vehicular access or part thereof.

C2.5 Class 9a and 9c buildings

(a) A Class 9a *health care building* must comply with the following:

(i) *Patient care areas* must be divided into *fire compartments* not exceeding 2000 m^2.

(ii) *Ward areas*—

(A) where the *floor area* exceeds 1000 m^2, must be divided into *floor areas* not more than 1000 m^2 by walls with an FRL of not less than 60/60/60; and

(B) where the *floor area* exceeds 500 m^2, must be divided into areas not more than 500 m^2 by smoke proof walls complying with **Specification C2.5**; and

(C) where division of *ward areas* by *fire-resisting* walls under **(i)** or **(ii)(A)** is not *required*, any smoke-proof wall *required* under **(ii)(B)** must have an FRL of not less than 60/60/60.

(iii) *Treatment areas* must be divided into *floor areas* not more than 1000 m^2 by smoke-proof walls complying with **Specification C2.5**.

(iv) A *fire compartment* must be separated from the remainder of the building by *fire walls* and—

(A) in Type A construction—floors and roof or ceiling as *required* in **Specification C1.1**; and

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(B) in Type B construction—floors with an FRL of not less than 120/120/120 and with the openings in *external walls* bounding *patient care areas* being vertically separated in accordance with the requirements of **C2.6** as if the building were of Type A construction.

(v) Ancillary use areas located within a *patient care area* and containing equipment or materials that are a high potential *fire hazard*, must be separated from the remainder of the *patient care area* by walls with an FRL of not less than 60/60/60.

(vi) The ancillary use areas referred to in **(v)** include, but are not limited to, the following:

(A) A kitchen and related food preparation areas having a combined *floor area* of more than 30 m^2.

(B) A room containing a hyperbaric facility (pressure chamber).

(C) A room used predominantly for the storage of medical records having a *floor area* of more than 10 m^2.

(D) A laundry, where items of equipment are of the type that are potential fire sources (eg. gas fire dryers).

(vii) A wall *required* by **(v)** to separate ancillary use areas from the remainder of the building must extend to the underside of—

(A) the floor above; or

(B) a *non-combustible* roof covering; or

(C) a ceiling having a *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes.

(viii) Openings in walls *required* by **(ii)** and **(v)** to have an FRL must be protected as follows:

(A) Doorways—*self-closing* or *automatic* closing –/60/30 fire doors.

(B) Windows—*automatic* or permanently fixed closed –/60/– fire windows or –/60/– *automatic* fire shutters.

(C) Other openings—construction having an FRL not less than –/60/–.

NSW C2 5(b)

(b) A Class 9c *aged care building* must comply with the following:

(i) A building must be divided into areas not more than 500 m^2 by smoke-proof walls complying with **Specification C2.5**.

(ii) A *fire compartment* must be separated from the remainder of the building by *fire walls* and, not withstanding **C2.7** and **Specification C1.1**, floors with an FRL of not less than 60/60/60.

(iii) Internal walls (other than those bounding lift and stair shafts) supported by floors provided in accordance with **C2.5(b)(ii)** need not comply with **Specification C1.1** if they have an FRL not less than 60/–/–

(iv) Ancillary use areas containing equipment or materials that are a high potential *fire hazard*, must be separated from the *sole-occupancy units* by smoke proof walls complying with **Specification C2.5**.

(v) The ancillary use areas referred to in **(iv)** include, but are not limited to, the following:

(A) A kitchen and related food preparation areas having a combined *floor area* of more than 30 m^2.

(B) A laundry, where items of equipment are of the type that are potential fire sources (eg. gas fire dryers).

(C) Storage rooms greater than 10 m^2 used predominantly for the storage of administrative records.

(vi) Openings in *fire walls* must be protected as follows:

(A) Doorways — *self-closing* or *automatic* closing –/60/30 fire doors.

(B) Windows — *automatic* or permanently fixed closed –/60/– fire windows or –/60/– *automatic* fire shutters.

(C) Other openings — construction having an FRL not less than –/60/–.

C2.6 Vertical separation of openings in external walls

(a) If in a building of Type A construction, any part of a *window* or other opening in an *external wall* is above another opening in the *storey* next below and its vertical projection falls no further than 450 mm outside the lower opening (measured horizontally), the openings must be separated by—

(i) a spandrel which—

(A) is not less than 900 mm in height; and

(B) extends not less than 600 mm above the upper surface of the intervening floor; and

(C) is of *non-combustible* material having an FRL of not less than 60/60/60; or

(ii) part of a *curtain wall* or *panel wall* that complies with **(i)**; or

(iii) construction that complies with **(i)** behind a *curtain wall* or *panel wall* and has any gaps packed with a *non-combustible* material that will withstand thermal expansion and structural movement of the walling without the loss of seal against fire and smoke; or

(iv) a slab or other horizontal construction that—

(A) projects outwards from the external face of the wall not less than 1100 mm; and

(B) extends along the wall not less than 450 mm beyond the openings concerned; and

(C) is *non-combustible* and has an FRL of not less than 60/60/60.

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(b) The requirements of **(a)** do not apply to—

(i) an *open-deck carpark*; or

(ii) an *open spectator stand*; or

(iii) a building which has a sprinkler system complying with **Specification E1.5** installed throughout; or

(iv) openings within the same stairway; or

(v) openings in *external walls* where the floor separating the *storeys* does not require an FRL with respect to *integrity* and *insulation*.

(c) For the purposes of **C2.6**, *window* or other opening means that part of the *external wall* of a building that does not have an FRL of 60/60/60 or greater.

C2.7 Separation by fire walls

(a) **Construction** — A *fire wall* must be constructed in accordance with the following:

(i) The *fire wall* has the relevant FRL prescribed by **Specification C1.1** for each of the adjoining parts, and if these are different, the greater FRL, except where **Tables 3.9**, **4.2** and **5.2 of Specification C1.1** permit a lower FRL on the *carpark* side.

(ii) Any openings in a *fire wall* must not reduce the FRL *required* by **Specification C1.1** for the *fire wall*, except where permitted by the *Deemed-to-Satisfy Provisions* of **Part C3**.

(iii) Building elements, other than roof battens with dimensions of 75 mm x 50 mm or less or *sarking-type material*, must not pass through or cross the *fire wall* unless the *required fire resisting* performance of the *fire wall* is maintained.

(b) **Separation of buildings** — A part of a building separated from the remainder of the building by a *fire wall* may be treated as a separate building for the purposes of the *Deemed-to-Satisfy Provisions* of **Sections C**, **D** and **E** if it is constructed in accordance with **(a)** and the following:

(i) The *fire wall* extends through all *storeys* and spaces in the nature of *storeys* that are common to that part and any adjoining part of the building.

(ii) The *fire wall* is carried through to the underside of the roof covering.

(iii) Where the roof of one of the adjoining parts is lower than the roof of the other part, the *fire wall* extends to the underside of—

(A) the covering of the higher roof, or not less than 6 m above the covering of the lower roof; or

(B) the lower roof if it has an FRL not less than that of the *fire wall* and no openings closer than 3 m to any wall above the lower roof; or

(C) the lower roof if its covering is *non-combustible* and the lower part has a sprinkler system complying with **Specification E1.5**.

(c) **Separation of fire compartments** — A part of a building separated from the remainder of the building by a *fire wall* may be treated as a separate *fire*

compartment if it is constructed in accordance with **(a)** and the *fire wall* extends to the underside of—

(i) a floor having an FRL *required* for a *fire wall*; or

(ii) the roof covering.

C2.8 Separation of classifications in the same storey

If a building has parts of different classifications located alongside one another in the same *storey*—

(a) each building element in that *storey* must have the higher FRL prescribed in **Specification C1.1** for that element for the classifications concerned; or

(b) the parts must be separated in that *storey* by a *fire wall* having—

(i) the higher FRL prescribed in **Table 3** or **4**; or

(ii) the FRL prescribed in **Table 5**,

of **Specification C1.1** as applicable, for that element for the Type of construction and the classifications concerned; or

(c) where one part is a carpark complying with **Table 3.9**, **4.2** or **5.2 of Specification C1.1**, the parts may be separated by a *fire wall* complying with the appropriate Table.

C2.9 Separation of classifications in different storeys

If parts of different classification are situated one above the other in adjoining *storeys* they must be separated as follows:

(a) Type A construction — The floor between the adjoining parts must have an FRL of not less than that prescribed in **Specification C1.1** for the classification of the lower *storey*.

(b) Type B or C construction — If one of the adjoining parts is of Class 2, 3 or 4, the floor separating the part from the *storey* below must—

(i) be a floor/ceiling system incorporating a ceiling which has a *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes; or

(ii) have an FRL of at least 30/30/30; or

(iii) have a *fire-protective covering* on the underside of the floor, including beams incorporated in it, if the floor is *combustible* or of metal.

C2.10 Separation of lift shafts

(a) Any lift connecting more than 2 *storeys*, or more than 3 *storeys* if the building is sprinklered, (other than lifts which are wholly within an *atrium*) must be separated from the remainder of the building by enclosure in a *shaft* in which—

(i) in a building *required* to be of Type A construction—the walls have the relevant FRL prescribed by **Specification C1.1**; and

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(ii) in a building *required* to be of Type B construction — the walls—

(A) if *loadbearing*, have the relevant FRL prescribed by **Table 4 of Specification C1.1**; or

(B) if non-*loadbearing*, be of *non-combustible* construction.

(b) Any lift in a *patient care area* in a Class 9a *health-care building* or a *resident use area* in Class 9c *aged care building* must be separated from the remainder of the building by a *shaft* having an FRL of not less than—

(i) in a building of Type A or B construction — 120/120/120; or

(ii) in a building of Type C construction — 60/60/60.

(c) An emergency lift must be contained within a *fire-resisting shaft* having an FRL of not less than 120/120/120.

(d) Openings for lift landing doors and services must be protected in accordance with the *Deemed-to-Satisfy Provisions* of **Part C3**.

C2.11 Stairways and lifts in one shaft

A stairway and lift must not be in the same *shaft* if either the stairway or the lift is *required* to be in a *fire-resisting shaft*.

C2.12 Separation of equipment

(a) Equipment other than that described in **(b)** and **(c)** must be separated from the remainder of the building with construction complying with **(d)**, if that equipment comprises—

(i) lift motors and lift control panels; or

(ii) emergency generators used to sustain emergency equipment operating in the emergency mode; or

(iii) central smoke control plant; or

(iv) boilers; or

(v) a battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.

(b) Equipment need not be separated in accordance with **(a)** if the equipment comprises—

(i) smoke control exhaust fans located in the air stream which are constructed for high temperature operation in accordance with **Specification E2.2b**; or

(ii) stair pressurising equipment installed in compliance with the relevant provisions of AS/NZS 1668.1; or

(iii) a lift installation without a machine-room; or

(iv) equipment otherwise adequately separated from the remainder of the building.

(c) Separation of on-site fire pumps must comply with the requirements of AS 2419.1.

(d) Separating construction must have—

(i) except as provided by (ii)—

(A) an FRL as *required* by **Specification C1.1**, but not less than 120/120/120; and

(B) any doorway protected with a *self-closing* fire door having an FRL of not less than –/120/30; or

(ii) when separating a lift *shaft* and lift motor room, an FRL not less than 120/–/–.

C2.13 Electricity supply system

(a) An electricity substation located within a building must—

(i) be separated from any other part of the building by construction having an FRL of not less than 120/120/120; and

(ii) have any doorway in that construction protected with a *self-closing* fire door having an FRL of not less than –/120/30.

(b) A main switchboard located within the building which sustains emergency equipment operating in the emergency mode must—

(i) be separated from any other part of the building by construction having an FRL of not less than 120/120/120; and

(ii) have any doorway in that construction protected with a *self-closing* fire door having an FRL of not less than –/120/30.

(c) Electrical conductors located within a building that supply—

(i) a substation located within the building which supplies a main switchboard covered by **(b)**; or

(ii) a main switchboard covered by **(b)**,

must—

(iii) have a classification in accordance with AS/NZS 3013 of not less than—

(A) if located in a position that could be subject to damage by motor vehicles — WS53W; or

(B) otherwise — WS52W; or

(iv) be enclosed or otherwise protected by construction having an FRL of not less than 120/120/120.

(d) Where emergency equipment is *required* in a building, all switchboards in the electrical installation, which sustain the electricity supply to the emergency equipment, must be constructed so that emergency equipment switchgear is separated from non-emergency equipment switchgear by metal partitions designed to minimise the spread of a fault from the non-emergency equipment switchgear.

(e) For the purposes of **(d)**, emergency equipment includes but is not limited to the following:

(i) Fire hydrant booster pumps.

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(ii) Pumps for *automatic* sprinkler systems, water spray, chemical fluid suppression systems or the like.

(iii) Pumps for fire hose reels where such pumps and fire hose reels form the sole means of fire protection in the building.

(iv) Air handling systems designed to exhaust and control the spread of fire and smoke.

(v) Emergency lifts.

(vi) Control and indicating equipment.

(vii) Sound systems and intercom systems for emergency purposes.

C2.14 Public corridors in Class 2 and 3 buildings

In a Class 2 or 3 building, a *public corridor*, if more than 40 m in length, must be divided at intervals of not more than 40 m with smoke-proof walls complying with **Clause 2 of Specification C2.5**.

SA C2.15

PART C3 PROTECTION OF OPENINGS

Deemed-to-Satisfy Provisions

C3.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **CP1** to **CP9** are satisfied by complying with—

(i) **C1.1** to **C1.12**, **C2.1** to **C2.14** and **C3.1** to **C3.17**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **C1.1** to **C1.12**, **C2.1** to **C2.14** and **C3.1** to **C3.17**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

C3.1 Application of Part

(a) The *Deemed-to-Satisfy Provisions* of this Part do not apply to—

(i) control joints, weep holes and the like in *external walls* of masonry construction and joints between panels in *external walls* of pre-cast concrete panel construction if, in all cases they are not larger than necessary for the purpose; and

(ii) *non-combustible* ventilators for sub-floor or cavity ventilation, if each does not exceed 45 000 mm^2 in face area and is spaced not less than 2 m from any other ventilator in the same wall; and

(iii) openings in the vertical plane formed between building elements at the construction edge or perimeter of a balcony or verandah, colonnade, terrace, or the like; and

(iv) in a *carpark*—

(A) service penetrations through; and

(B) openings formed by a vehicle ramp in,

a floor other than a floor that separates a part not used as a *carpark*.

(b) For the purposes of the *Deemed-to-Satisfy Provisions* of this Part, openings in building elements *required* to be *fire-resisting* include doorways, *windows* (including any associated fanlight), infill panels and fixed or openable glazed areas that do not have the *required* FRL.

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(c) For the purposes of the *Deemed-to-Satisfy Provisions* of this Part, openings, other than those covered under **(a)(iii)**, between building elements such as columns, beams and the like, in the plane formed at the construction edge or perimeter of the building, are deemed to be openings in an *external wall*.

C3.2 Protection of openings in external walls

Openings in an *external wall* that is *required* to have an FRL must—

(a) if the distance between the opening and the *fire-source feature* to which it is exposed is less than—

(i) 3 m from a side or rear boundary of the allotment; or

(ii) 6 m from the far boundary of a road, river, lake or the like adjoining the allotment, if not located in a *storey* at or near ground level; or

(iii) 6 m from another building on the allotment that is not Class 10,

be protected in accordance with **C3.4** and if wall-wetting sprinklers are used, they are located externally; and

(b) if *required* to be protected under **(a)**, not occupy more than 1/3 of the area of the *external wall* of the *storey* in which it is located unless they are in a Class 9b building used as an *open spectator stand*.

C3.3 Separation of external walls and associated openings in different fire compartments

The distance between parts of *external walls* and any openings within them in different *fire compartments* separated by a *fire wall* must not be less than that set out in **Table C3.3**, unless—

(a) those parts of each wall have an FRL not less than 60/60/60; and

(b) any openings protected in accordance with **C3.4**.

Table C3.3 DISTANCE BETWEEN EXTERNAL WALLS AND ASSOCIATED OPENINGS IN DIFFERENT FIRE COMPARTMENTS

Angle between walls	Min. Distance
0° (walls opposite)	6 m
more than 0° to 45°	5 m
more than 45° to 90°	4 m
more than 90° to 135°	3 m
more than 135° to less than 180°	2 m
180° or more	Nil

C3.4 Acceptable methods of protection

(a) Where protection is *required*, doorways, *windows* and other openings must be protected as follows:

(i) Doorways—

(A) internal or external wall-wetting sprinklers as appropriate used with doors that are *self-closing* or *automatic* closing; or

(B) –/60/30 fire doors that are *self-closing* or *automatic* closing.

(ii) *Windows*—

(A) internal or external wall-wetting sprinklers as appropriate used with *windows* that are *automatic* closing or permanently fixed in the closed position; or

(B) –/60/– fire *windows* that are *automatic* closing or permanently fixed in the closed position; or

(C) –/60/– *automatic* closing fire shutters.

(iii) Other openings—

(A) excluding voids — internal or external wall-wetting sprinklers, as appropriate; or

(B) construction having an FRL not less than –/60/–.

(b) Fire doors, fire *windows* and fire shutters must comply with **Specification C3.4**.

C3.5 Doorways in fire walls

(a) The aggregate width of openings for doorways in a *fire wall*, which are not part of a *horizontal exit*, must not exceed ½ of the length of the *fire wall*, and each doorway must be protected by—

(i) 2 fire doors or fire shutters, one on each side of the doorway, each of which has an FRL of not less than ½ that *required* by **Specification C1.1** for the *fire wall* except that each door or shutter must have an *insulation* level of at least 30; or

(ii) a fire door on one side and a fire shutter on the other side of the doorway, each of which complies with **(i)**; or

(iii) a single fire door or fire shutter which has an FRL of not less than that *required* by **Specification C1.1** for the *fire wall* except that each door or shutter must have an *insulation* level of at least 30.

(b)

(i) A fire door or fire shutter *required* by **(a)(i)**, **(a)(ii)** or **(a)(iii)** must be *self-closing*, or *automatic* closing in accordance with **(ii)** and **(iii)**.

(ii) The *automatic* closing operation must be initiated by the activation of a smoke detector, or any other detector deemed suitable in accordance with AS 1670.1 if smoke detectors are unsuitable in the atmosphere, installed in accordance with the relevant provisions of AS 1670.1 and located on each side of the *fire wall* not more than 1.5 m horizontal distance from the opening.

(iii) Where any other *required* suitable fire alarm system, including a sprinkler system complying with **Specification E1.5**, is installed in the building,

activation of the system in either *fire compartment* separated by the *fire wall* must also initiate the *automatic* closing operation.

C3.6 Sliding fire doors

(a) If a doorway in a *fire wall* is fitted with a sliding fire door which is open when the building is in use—

(i) it must be held open with an electromagnetic device, which when de-activated in accordance with **(b)**, allows the door to be fully closed in not less than 20 seconds and not more than 30 seconds after release; and

(ii) in the event of power failure to the door — the door must fail safe in the closed position in accordance with **(i)**; and

(iii) an audible warning device must be located near the doorway and a red flashing warning light of adequate intensity on each side of the doorway must be activated in accordance with **(b)**; and

(iv) signs must be installed on each side of the *doorway* located directly over the opening stating—

WARNING — SLIDING FIRE DOOR

in capital letters not less than 50 mm high in a colour contrasting with the background.

(b)

(i) The electromagnetic device must be de-activated and the warning system activated by heat or smoke detectors, as appropriate, installed in accordance with AS/NZS 1905.1 and the relevant provisions of AS 1670.1.

(ii) Where any other *required* suitable fire alarm system, including a sprinkler system complying with **Specification E1.5**, is installed in the building, activation in either *fire compartment* separated by the *fire wall* must also de-activate the electromagnetic device and activate the warning system.

C3.7 Protection of doorways in horizontal exits

(a) A doorway that is part of a *horizontal exit* must be protected by either—

(i) a single fire door that has an FRL of not less than that *required* by **Specification C1.1** for the *fire wall* except that the door must have an *insulation* level of at least 30; or

(ii) in a Class 7 or 8 building — 2 fire doors, one on each side of the doorway, each with an FRL of not less than ½ that *required* by **Specification C1.1** for the *fire wall* except that each door must have an *insulation* level of at least 30.

(b)

(i) Each door *required* by **(a)** must be *self-closing*, or *automatic*-closing in accordance with **(ii)** and **(iii)**.

(ii) The *automatic*-closing operation must be initiated by the activation of a smoke detector, or any other detector deemed suitable in accordance with AS 1670.1 if smoke detectors are unsuitable in the atmosphere, installed in accordance with the relevant provisions of AS 1670.1 and located on each side of the *fire wall* not more than 1.5 m horizontal distance from the opening.

(iii) Where any other *required* suitable fire alarm system, including a sprinkler system complying with **Specification E1.5**, is installed in the building, activation of the system in either *fire compartment* separated by the *fire wall* must also initiate the *automatic*-closing operation.

C3.8 Openings in fire-isolated exits

(a)

(i) Doorways that open to *fire-isolated stairways*, *fire-isolated passageways* or *fire-isolated ramps*, and are not doorways opening to a road or *open space*, must be protected by –/60/30 fire doors that are *self-closing*, or *automatic*-closing in accordance with **(ii)** and **(iii)**.

(ii) The *automatic*-closing operation must be initiated by the activation of a smoke detector, or any other detector deemed suitable in accordance with AS 1670 if smoke detectors are unsuitable in the atmosphere, installed in accordance with the relevant provisions of AS 1670.1 and located not more than 1.5 m horizontal distance from the approach side of the doorway.

(iii) Where any other *required* suitable fire alarm system, including a sprinkler system complying with **Specification E1.5**, is installed in the building, activation of the system must also initiate the *automatic*-closing operation.

(b) A *window* in an *external wall* of a *fire-isolated stairway*, *fire-isolated passageway* or *fire-isolated ramp* must be protected in accordance with **C3.4** if it is within 6 m of, and exposed to, a *window* or other opening in a wall of the same building, other than in the same fire-isolated enclosure.

C3.9 Service penetrations in fire-isolated exits

Fire-isolated *exits* must not be penetrated by any services other than—

(a) electrical wiring permitted by **D2.7(e)** to be installed within the *exit*; or

(b) ducting associated with a pressurisation system if it—

(i) is constructed of material having an FRL of not less than –/120/60 where it passes through any other part of the building; and

(ii) does not open into any other part of the building, or

(c) water supply pipes for fire services.

C3.10 Openings in fire-isolated lift shafts

(a) **Doorways** — If a lift *shaft* is *required* to be fire-isolated, an entrance doorway to that *shaft* must be protected by –/60/– fire doors that—

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(i) comply with AS 1735.11; and

(ii) are set to remain closed except when discharging or receiving passengers, goods or vehicles.

(b) **Lift indicator panels** — A lift call panel, indicator panel or other panel in the wall of a fire-isolated lift *shaft* must be backed by construction having an FRL of not less than –/60/60 if it exceeds 35 000 mm^2 in area.

C3.11 Bounding construction: Class 2, 3 and 4 buildings

(a) A doorway in a Class 2 or 3 building must be protected if it provides access from a *sole-occupancy unit* to—

(i) a *public corridor*, public lobby, or the like; or

(ii) a room not within a *sole-occupancy unit*; or

(iii) the landing of an internal non *fire-isolated stairway* that serves as a *required exit*; or

(iv) another *sole-occupancy unit*.

(b) A doorway in a Class 2 or 3 building must be protected if it provides access from a room not within a *sole-occupancy unit* to—

(i) a *public corridor*, public lobby, or the like; or

(ii) the landing of an internal non *fire-isolated stairway* that serves as a *required exit*.

(c) A doorway in a Class 4 part must be protected if it provides access to any other internal part of the building.

NSW C3.11(d)

(d) Protection for a doorway must be at least—

(i) in a building of Type A construction — a *self-closing* –/60/30 fire door; and

(ii) in a building of Type B or C construction — a *self-closing*, tight fitting, solid core door, not less than 35 mm thick,

except—

(iii) in a Class 3 building used as a *residential aged care building* protected with a sprinkler system complying with **Specification E1.5**—

(A) a tight fitting, solid core door not less than 35 mm thick if the building is divided into *floor areas* not exceeding 500 m^2 with smoke proof walls complying with **Clause 2 of Specification C2.5**; or

(B) a tight fitting, solid core door not less than 35 mm thick fitted with a *self-closing* device, a delayed closing device or an *automatic* closing device.

(e) Other openings in *internal walls* which are *required* to have an FRL with respect to *integrity* and *insulation* must not reduce the *fire-resisting* performance of the wall.

(f)

(i) A door *required* by **(d)** may be *automatic*-closing in accordance with **(ii)** and **(iii)**.

(ii) The *automatic*-closing operation must be initiated by the activation of a smoke detector, or any other detector deemed suitable in accordance with AS 1670.1 if smoke detectors are unsuitable in the atmosphere, installed in accordance with the relevant provisions of AS 1670.1 and located not more than 1.5 m horizontal distance from the approach side of the doorway.

(iii) Where any other *required* suitable fire alarm system, including a sprinkler system complying with **Specification E1.5**, is installed in the building, activation of the system must also initiate the *automatic*-closing operation.

(g) In a Class 2 or 3 building where a path of travel to an *exit* does not provide a person seeking egress with a choice of travel in different directions to alternative *exits* and is along an open balcony, landing or the like and passes an *external wall* of—

(i) another *sole-occupancy unit*; or

(ii) a room not within a *sole-occupancy unit*,

then that *external wall* must—

(iii) be constructed of concrete or masonry, or be lined internally with a *fire-protective covering*; and

(iv) have any doorway fitted with a *self-closing*, tight-fitting solid core door not less than 35 mm thick; and

(v) have any *windows* or other openings—

(A) protected internally in accordance with **C3.4**; or

(B) located at least 1.5 m above the floor of the balcony, landing or the like.

NSW C3.11(h)

C3.12 Openings in floors and ceilings for services

(a) Where a service passes through—

(i) a floor that is *required* to have an FRL with respect to *integrity* and *insulation*; or

(ii) a ceiling *required* to have a *resistance to the incipient spread of fire*,

the service must be installed in accordance with **(b)**.

(b) A service must be protected—

(i) in a building of Type A construction, by a *shaft* complying with **Specification C1.1**; or

(ii) in a building of Type B or C construction, by a *shaft* that will not reduce the fire performance of the building elements it penetrates; or

(iii) in accordance with **C3.15**.

(c) Where a service passes through a floor which is *required* to be protected by a *fire-protective covering*, the penetration must not reduce the fire performance of the covering.

C3.13 Openings in shafts

In a building of Type A construction, an opening in a wall providing access to a ventilating, pipe, garbage or other service *shaft* must be protected by—

(a) if it is in a *sanitary compartment* — a door or panel which, together with its frame, is *non-combustible* or has an FRL of not less than –/30/30; or

(b) a *self-closing* –/60/30 fire door or hopper; or

(c) an access panel having an FRL of not less than –/60/30, or

(d) if the *shaft* is a garbage *shaft* — a door or hopper of *non-combustible* construction.

C3.14 * * * * *

This clause has deliberately been left blank.

C3.15 Openings for service installations

Where an electrical, electronic, plumbing, mechanical ventilation, air-conditioning or other service penetrates a building element (other than an *external wall* or roof) that is *required* to have an FRL with respect to *integrity* or *insulation* or a *resistance to the incipient spread of fire*, that installation must comply with any one of the following:

(a) **Tested systems**

(i) The service, building element and any protection method at the penetration are identical with a prototype assembly of the service, building element and protection method which has been tested in accordance with AS 4072.1 and AS 1530.4 and has achieved the *required* FRL or *resistance to the incipient spread of fire*.

(ii) It complies with **(i)** except for the *insulation* criteria relating to the service if—

(A) the service is a pipe system comprised entirely of metal (excluding pipe seals or the like); and

(B) any *combustible* building element is not located within 100 mm of the service for a distance of 2 m from the penetration; and

(C) *combustible* material is not able to be located within 100 mm of the service for a distance of 2 m from the penetration; and

(D) it is not located in a *required exit*.

(b) **Ventilation and air-conditioning** — In the case of ventilating or air-conditioning ducts or equipment, the installation is in accordance with AS/NZS 1668.1.

(c) **Compliance with Specification C3.15**

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(i) The service is a pipe system comprised entirely of metal (excluding pipe seals or the like) and is installed in accordance with **Specification C3.15** and it—

(A) penetrates a wall, floor or ceiling, but not a ceiling *required* to have a *resistance to the incipient spread of fire*; and

(B) connects not more than 2 *fire compartments* in addition to any *fire-resisting* service *shafts*; and

(C) does not contain a flammable or combustible liquid or gas.

(ii) The service is sanitary plumbing installed in accordance with **Specification C3.15** and it—

(A) is of metal or UPVC pipe; and

(B) penetrates the floors of a Class 5, 6, 7, 8 or 9b building; and

(C) is in a *sanitary compartment* separated from other parts of the building by walls with the FRL *required* by **Specification C1.1** for a stair *shaft* in the building and a *self-closing* –/60/30 fire door.

(iii) The service is a wire or cable, or a cluster of wires or cables installed in accordance with **Specification C3.15** and it—

(A) penetrates a wall, floor or ceiling, but not a ceiling *required* to have a *resistance to the incipient spread of fire*; and

(B) connects not more than 2 *fire compartments* in addition to any *fire-resisting* service *shafts*.

(iv) The service is an electrical switch, outlet, or the like, and it is installed in accordance with **Specification C3.15**.

C3.16 Construction joints

Construction joints, spaces and the like in and between building elements *required* to be *fire-resisting* with respect to *integrity* and *insulation* must be protected in a manner identical with a prototype tested in accordance with AS 1530.4 to achieve the *required* FRL.

C3.17 Columns protected with lightweight construction to achieve an FRL

A column protected by *lightweight construction* to achieve an FRL which passes through a building element that is *required* to have an FRL or a *resistance to the incipient spread of fire*, must be installed using a method and materials identical with a prototype assembly of the construction which has achieved the *required* FRL or *resistance to the incipient spread of fire*.

SPECIFICATION C1.1 FIRE-RESISTING CONSTRUCTION

1. SCOPE

This Specification contains requirements for the *fire-resisting construction* of building elements.

2. GENERAL REQUIREMENTS

2.1 Exposure to fire-source features

(a) A part of a building element is exposed to a *fire-source feature* if any of the horizontal straight lines between that part and the *fire-source feature*, or vertical projection of the feature, is not obstructed by another part of the building that—

(i) has an FRL of not less than 30/–/–; and

(ii) is neither transparent nor translucent.

(b) A part of a building element is not exposed to a *fire-source feature* if the *fire-source feature* is—

(i) an *external wall* of another building that stands on the allotment and the part concerned is more than 15 m above the highest part of that *external wall*; or

(ii) a side or rear boundary of the allotment and the part concerned is below the level of the finished ground at every relevant part of the boundary concerned.

(c) If various distances apply for different parts of a building element—

(i) the entire element must have the FRL applicable to that part having the least distance between itself and the relevant *fire-source feature*; or

(ii) each part of the element must have the FRL applicable according to its individual distance from the relevant *fire-source feature*,

but this provision does not override or permit any exemption from **Clause 2.2**.

2.2 Fire protection for a support of another part

(a) Where a part of a building *required* to have an FRL depends upon direct vertical or lateral support from another part to maintain its FRL, that supporting part, subject to **(b)**, must—

(i) have an FRL not less than that *required* by other provisions of this Specification; and

(ii) if located within the same *fire compartment* as the part it supports have an FRL in respect of *structural adequacy* the greater of that *required*—

(A) for the supporting part itself; and

(B) for the part it supports; and

(iii) be *non-combustible*—

(A) if *required* by other provisions of this Specification; or

(B) if the part it supports is *required* to be *non-combustible*.

(b) The following building elements need not comply with **(a)(ii)** and **(a)(iii)(B)**:

(i) An element providing lateral support to an *external wall* complying with **Clause 5.1(b)** or **C1.11**.

(ii) An element providing support within a *carpark* and complying with **Clause 3.9**, **4.2** or **5.2**.

(iii) A roof providing lateral support in a building—

(A) of Type A construction if it complies with **Clause 3.5(a)**, **(b)** or **(d)**; and

(B) of Type B and C construction.

(iv) A column providing lateral support to a wall where the column complies with **Clause 2.5(a)** and **(b)**.

(v) An element providing lateral support to a *fire wall* or *fire-resisting* wall, provided the wall is supported on both sides and failure of the element on one side does not affect the fire performance of the wall.

2.3 Lintels

A lintel must have the FRL *required* for the part of the building in which it is situated, unless it does not contribute to the support of a fire door, fire *window* or fire shutter, and—

(a) it spans an opening in—

(i) a wall of a building containing only one *storey*; or

(ii) a non-*loadbearing* wall of a Class 2 or 3 building; or

(b) it spans an opening in masonry which is not more than 150 mm thick and—

(i) not more than 3 m wide if the masonry is non-*loadbearing*; or

(ii) not more than 1.8 m wide if the masonry is *loadbearing* and part of a solid wall or one of the leaves of a cavity wall.

2.4 Attachments not to impair fire-resistance

(a) A *combustible* material may be used as a finish or lining to a wall or roof, or in a sign, sunscreen or blind, awning, or other attachment to a building element which has the *required* FRL if—

(i) the material is exempted under **C1.10** or complies with the *fire hazard properties* prescribed in **Specification C1.10**; and

(ii) it is not located near or directly above a *required exit* so as to make the *exit* unusable in a fire; and

(iii) it does not otherwise constitute an undue risk of fire spread via the facade of the building.

(b) The attachment of a facing or finish, or the installation of ducting or any other service, to a part of a building *required* to have an FRL must not impair the *required* FRL of that part.

2.5 General concessions

(a) **Steel columns** — A steel column, other than one in a *fire wall* or *common wall*, need not have an FRL in a building that contains—

(i) only 1 *storey*; or

(ii) 2 *storeys* in some of its parts and 1 *storey* only in its remaining parts if the sum of the *floor areas* of the upper *storeys* of its 2 *storey* parts does not exceed the lesser of—

(A) 1/8 of the sum of the *floor areas* of the 1 *storey* parts; or

(B) in the case of a building to which one of the maximum *floor areas* specified in **Table C2.2** is applicable — 1/10 of that area; or

(C) in the case of a building to which two or more of the maximum *floor areas* specified in **Table C2.2** is applicable — 1/10 of the lesser of those areas.

(b) **Timber columns** — A timber column may be used in a single *storey* building if—

(i) in a *fire wall* or *common wall* the column has an FRL not less than that listed in the appropriate **Table 3**, **4** or **5**; and

(ii) in any other case where the column is *required* to have an FRL in accordance with **Table 3**, **4** or **5**, it has an FRL of not less than 30/–/–.

(c) **Structures on roofs** — A *non-combustible* structure situated on a roof need not comply with the other provisions of this Specification if it only contains—

(i) lift motor equipment; or

(ii) one or more of the following:

(A) Hot water or other water tanks.

(B) Ventilating ductwork, ventilating fans and their motors.

(C) Air-conditioning chillers.

(D) *Window* cleaning equipment.

(E) Other service units that are *non-combustible* and do not contain flammable or combustible liquids or gases.

(d) **Curtain walls and panel walls** — A requirement for an *external wall* to have an FRL does not apply to a *curtain wall* or *panel wall* which is of *non-combustible* construction and fully protected by *automatic* external wall-wetting sprinklers.

(e) * * * * *

This clause has deliberately been left blank.

(f) **Balconies and verandahs** — A balcony, verandah or the like and any incorporated supporting part, which is attached to or forms part of a building, need not comply with **Tables 3**, **4** and **5** if—

(i) it does not form part of the only path of travel to a *required exit* from the building; and

(ii) in Type A construction—

(A) it is situated not more than 2 *storeys* above the lowest *storey* providing direct egress to a road or *open space*; and

(B) any supporting columns are of *non-combustible* construction.

2.6 Mezzanine floors: Concession

(a) This Clause does not apply to a Class 9b building that is a spectator stand or audience viewing area accommodating more than 100 persons as calculated according to **D1.13**.

(b) A *mezzanine* and its supports need not have an FRL or be *non-combustible* provided—

(i) the total *floor area* of all the *mezzanines* in the same room does not exceed 1/3 of the *floor area* of the room or 200 m^2, whichever is the lesser; and

(ii) the FRL of each wall and column that supports any other part of the building within 6 m of the *mezzanine* is increased by the amount listed in **Table 2.6**.

Table 2.6 INCREASED FRLs — CONSTRUCTION SURROUNDING MEZZANINES

Level otherwise required for any FRL criterion (mins)	Increase in level to (not less than):
30	60
60	90
90	120
120	180
180	240

The increase in level applies to each FRL criterion (*structural adequacy*, *integrity* or *insulation*) relevant to the building element concerned.

2.7 Enclosure of shafts

Shafts required to have an FRL must be enclosed at the top and bottom by construction having an FRL not less than that *required* for the walls of a non-*loadbearing shaft* in the same building, except that these provisions need not apply to—

(a) the top of a *shaft* extending beyond the roof covering, other than one enclosing a *fire-isolated stairway* or *ramp*; or

(b) the bottom of a *shaft* if it is *non-combustible* and laid directly on the ground.

2.8 Carparks in Class 2 and 3 buildings

(a) If a Class 2 building contains not more than 4 *storeys* of which—

(i) one *storey* is Class 7 used solely for the purpose of parking motor vehicles or for some other purpose that is ancillary to a Class 2; and

(ii) the remaining *storeys* are of Class 2,

the *carpark storey* is regarded as Class 2 only for the purpose of determining the relevant *fire-resisting* requirements of this Specification.

(b) If a Class 3 building or a building of Class 2 and 3 contains not more than 3 *storeys* of which—

(i) one *storey* is Class 7 used solely for the purpose of parking motor vehicles or for some other purpose that is ancillary to the other *storeys*; and

(ii) the remaining *storeys* are of Class 2 or 3,

the *carpark storey* is regarded as Class 2 or 3 only for the purpose of determining the relevant *fire-resisting* requirements of this Specification.

2.9 Residential aged care building: Concession

In a Class 3 building protected with a sprinkler system complying with **Specification E1.5** and used as a *residential aged care building*, any FRL criterion prescribed in **Tables 3**, **4** or **5**—

(a) for any floor and any *loadbearing* wall, may be reduced to 60, except any FRL criterion of 90 for an *external wall* must be maintained when tested from the outside; and

(b) for any non-*loadbearing internal wall*, need not apply if—

(i) it is lined on each side with standard grade plasterboard not less than 13 mm thick or similar *non-combustible* material; and

(ii) it extends—

(A) to the underside of the floor next above; or

(B) to the underside of a ceiling lined with standard grade plasterboard not less than 13 mm thick or a material with at least an equivalent level of fire protection; or

(C) to the underside of a *non-combustible* roof covering; and

(iii) any insulation installed in the cavity of the wall is *non-combustible*; and

(iv) any construction joint, space or the like between the top of the wall and the floor, ceiling or roof is smoke sealed with intumescent putty or other suitable material.

3. TYPE A FIRE-RESISTING CONSTRUCTION

3.1 Fire-resistance of building elements

In a building *required* to be of Type A construction—

(a) each building element listed in **Table 3** and any beam or column incorporated in it, must have an FRL not less than that listed in the Table for the particular Class of building concerned; and

(b) *external walls*, *common walls* and the flooring and floor framing of lift pits must be *non-combustible*; and

(c) any *internal wall required* to have an FRL with respect to *integrity* and *insulation* must extend to—

(i) the underside of the floor next above; or

(ii) the underside of a roof complying with **Table 3**; or

(iii) if under **Clause 3.5** the roof is not *required* to comply with **Table 3**, the underside of the *non-combustible* roof covering and, except for roof battens with dimensions of 75 mm x 50 mm or less or *sarking-type material*, must not be crossed by timber or other *combustible* building elements; or

(iv) a ceiling that is immediately below the roof and has a *resistance to the incipient spread of fire* to the roof space between the ceiling and the roof of not less than 60 minutes; and

(d) a *loadbearing internal wall* and a *loadbearing fire wall* (including those that are part of a *loadbearing shaft*) must be of concrete or masonry; and

(e) a non-*loadbearing*—

(i) *internal wall required* to be *fire-resisting*; and

(ii) lift, ventilating, pipe, garbage, or similar *shaft* that is not for the discharge of hot products of combustion,

must be of *non-combustible* construction; and

(f) the FRLs specified in **Table 3** for an external column apply also to those parts of an internal column that face and are within 1.5 m of a *window* and are exposed through that *window* to a *fire-source feature*.

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building — FRL: (in minutes) *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—				
For *loadbearing* parts—				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 60	120/ 90/ 90	180/180/120	240/240/180
3 m or more	90/ 60/ 30	120/ 60/ 30	180/120/ 90	240/180/ 90
For non-*loadbearing* parts—				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 60	–/ 90/ 90	–/180/120	–/240/180
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*, where the distance from any *fire-source feature* to which it is exposed is—				
less than 3 m	90/–/–	120/–/–	180/–/–	240/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
Fire-resisting lift and stair *shafts*—				
Loadbearing	90/ 90/ 90	120/120/120	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding *public corridors*, public lobbies and the like—				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—				
Loadbearing	90/ 90/ 90	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Ventilating, pipe, garbage, and like *shafts* not used for the discharge of hot products of combustion—				
Loadbearing	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
Non-*loadbearing*	–/ 90/ 90	–/ 90/ 90	–/120/120	–/120/120

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS (Continued)

Building element	Class of building — FRL: (in minutes) *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS—	90/–/–	120/–/–	180/–/–	240/–/–
FLOORS	90/ 90/ 90	120/120/120	180/180/180	240/240/240
ROOFS	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60

3.2 Concessions for floors

A floor need not comply with **Table 3** if—

(a) it is laid directly on the ground; or

(b) in a Class 2, 3, 5 or 9 building, the space below is not a *storey*, does not accommodate motor vehicles, is not a storage or work area, and is not used for any other ancillary purpose; or

(c) it is a timber *stage* floor in a Class 9b building laid over a floor having the *required* FRL and the space below the *stage* is not used as a dressing room, store room, or the like; or

(d) it is within a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part; or

(e) it is an open-access floor (for the accommodation of electrical and electronic services and the like) above a floor with the *required* FRL.

3.3 Floor loading of Class 5 and 9b buildings: Concession

If a floor in a Class 5 or 9b building is designed for a live load not exceeding 3 kPa—

(a) the floor next above (including floor beams) may have an FRL of 90/90/90; or

(b) the roof, if that is next above (including roof beams) may have an FRL of 90/ 60/30.

3.4 Roof superimposed on concrete slab: Concession

A roof superimposed on a concrete slab roof need not comply with **Clause 3.1** as to *fire-resisting construction* if—

(a) the superimposed roof and any construction between it and the concrete slab roof are *non-combustible* throughout; and

(b) the concrete slab roof complies with **Table 3**.

3.5 Roof: Concession

A roof need not comply with **Table 3** if its covering is *non-combustible* and the building—

(a) has a sprinkler system complying with **Specification E1.5** installed throughout; or

(b) has a *rise in storeys* of 3 or less; or

(c) is of Class 2 or 3; or

(d) has an *effective height* of not more than 25 m and the ceiling immediately below the roof has a *resistance to the incipient spread of fire* to the roof space of not less than 60 minutes.

3.6 Rooflights

If a roof is *required* to have an FRL or its covering is *required* to be *non-combustible*, rooflights or the like installed in that roof must—

(a) have an aggregate area of not more than 20% of the roof surface; and

(b) be not less than 3 m from—

(i) any boundary of the allotment other than the boundary with a road or public place; and

(ii) any part of the building which projects above the roof unless that part has the FRL *required* of a *fire wall* and any openings in that part of the wall for 6 m vertically above the rooflight or the like are protected in accordance with **C3.4**; and

(iii) any rooflight or the like in an adjoining *sole-occupancy unit* if the walls bounding the unit are *required* to have an FRL; and

(iv) any rooflight or the like in an adjoining fire-separated section of the building; and

(c) if a ceiling with a *resistance to the incipient spread of fire* is *required*, be installed in a way that will maintain the level of protection provided by the ceiling to the roof space.

3.7 Internal columns and walls: Concession

For a building with an *effective height* of not more than 25 m and having a roof without an FRL in accordance with **Clause 3.5**, in the *storey* immediately below that roof, internal columns other than those referred to in **Clause 3.1(f)** and *internal walls* other than *fire walls* and *shaft* walls may have—

(a) in a Class 2 or 3 building: FRL 60/60/60; or

(b) in a Class 5, 6, 7, 8 or 9 building—

(i) with *rise in storeys* exceeding 3: FRL 60/60/60

(ii) with *rise in storeys* not exceeding 3: no FRL.

3.8 Open spectator stands and indoor sports stadiums: Concession

In an *open spectator stand* or indoor sports stadium, the following building elements need not have the FRL specified in **Table 3**:

(a) The roof if it is *non-combustible*.

(b) Columns and *loadbearing* walls supporting only the roof if they are *non-combustible*.

(c) Any non-*loadbearing* part of an *external wall* less than 3 m—

(i) from any *fire-source feature* to which it is exposed if it has an FRL of not less than –/60/60 and is *non-combustible*; or

(ii) from an *external wall* of another *open spectator stand* if it is *non-combustible*.

3.9 Carparks

(a) Notwithstanding **Clause 3.1**, a *carpark* may comply with **Table 3.9** if it is an *open-deck carpark* or is protected with a sprinkler system complying with **Specification E1.5** and is—

(i) a separate building; or

(ii) a part of a building—

(A) which only occupies part of a *storey*, and is separated from the remaining part by a *fire wall*; or

(B) which is located above or below another classification, and the floor separating the classifications complies with **C2.9**; or

(C) which is located above another Class 7 part of the building not used for carparking, and the floor separating the parts complies with **Table 3** for a Class 7 part other than a *carpark*; or

(D) which is located below another Class 7 part of the building not used for carparking, and the floor separating the parts complies with **Table 3.9**.

(b) For the purposes of this clause, a *carpark*—

(i) includes—

(A) an administration area associated with the functioning of the *carpark*; and

(B) where the *carpark* is sprinklered, is associated with a Class 2 or 3 building and provides carparking for separate *sole-occupancy units*, each carparking area with an area not greater than 10% of its *floor area* for purposes ancillary to the *sole-occupancy units*; but

(ii) excludes—

(A) except for **(b)(i)**, any area of another classification, or other part of a Class 7 building not used for carparking; and

(B) a building or part of a building specifically intended for the parking of trucks, buses, vans and the like.

Table 3.9 REQUIREMENTS FOR CARPARKS

Building element	FRL (not less than) *Structural adequacy/Integrity/Insulation* **ESA/M** (not greater than)
Wall	
(a) *external wall*	
(i) less than 3 m from a *fire-source feature* to which it is exposed:	
Loadbearing	60/60/60
Non-*loadbearing*	–/60/60
(ii) 3 m or more from a *fire-source feature* to which it is exposed	–/–/–
(b) *internal wall*	
(i) *loadbearing*, other than one supporting only the roof (not used for carparking)	60/–/–
(ii) supporting only the roof (not used for carparking)	–/–/–
(iii) non-*loadbearing*	–/–/–
(c) *fire wall*	
(i) from the direction used as a *carpark*	60/60/60
(ii) from the direction not used as a *carpark*	as *required* by **Table 3**
Column	
(a) supporting only the roof (not used for carparking) and 3 m or more from a *fire-source feature* to which it is exposed	–/–/–
(b) steel column, other than one covered by (a) and one that does not support a part of a building that is not used as a *carpark*	60/–/– or 26 m^2/tonne
(c) any other column not covered by (a) or (b)	60/–/–
Beam	
(a) steel floor beam in continuous contact with a concrete floor slab	60/–/– or 30 m^2/tonne
(b) any other beam	60/–/–
Fire-resisting lift and stair shaft (within the *carpark* only)	60/60/60

Table 3.9 REQUIREMENTS FOR CARPARKS (Continued)

Building element	FRL (not less than) *Structural adequacy/Integrity/Insulation* ESA/M (not greater than)
Floor slab and vehicle ramp	60/60/60
Roof (not used for carparking)	–/–/–

Notes:
1. ESA/M means the ratio of exposed surface area to mass per unit length.
2. Refer to **Specification E1.5** for special requirements for a sprinkler system in a *carpark* complying with Table 3.9 and located within a multi-classified building.

3.10 Class 2 buildings: Concession

(a) A Class 2 building having a *rise in storeys* of not more than 3 need not comply with **Clauses 3.1(b)**, **(d)** and **(e) of Specification C1.1** and the requirement of **C2.6** for *non-combustible* material, if it is constructed using—

(i) timber framing throughout; or

(ii) *non-combustible* material throughout; or

(iii) a combination of **(i)** and **(ii)**,

provided—

(iv) * * * * *

(v) any insulation installed in the cavity of a wall *required* to have an FRL is *non-combustible*; and

(vi) the building is fitted with an *automatic* smoke alarm system complying with **Specification E2.2a**.

(b) A Class 2 building having a *rise in storeys* of not more than 4 may have the top three *storeys* constructed in accordance with **(a)** provided—

(i) the lowest *storey* is used solely for the purpose of parking motor vehicles or for some other ancillary purpose; and

(ii) the lowest *storey* is constructed of concrete or masonry including the floor between it and the Class 2 part of the building above; and

(iii) the lowest *storey* and the *storey* above are separated by construction having an FRL of not less than 90/90/90 with no openings or penetrations that would reduce the *fire-resisting* performance of that construction except that a doorway in that construction may be protected by a –/60/30 *self-closing* fire door.

(c) In a Class 2 building complying with **(a)** or **(b)** and fitted with a sprinkler system complying with **Specification E1.5**, any FRL criterion prescribed in **Table 3**—

(i) for any floor and any *loadbearing* wall, may be reduced to 60, except any FRL criterion of 90 for an *external wall* must be maintained when tested from the outside; and

(ii) for any non-*loadbearing internal wall*, need not apply if—

(A) it is lined on each side with 13 mm standard grade plasterboard or similar *non-combustible* material; and

(B) it extends—

(aa) to the underside of the floor next above; or

(bb) to the underside of a ceiling with a *resistance to the incipient spread of fire* of 60 minutes; or

(cc) to the underside of a *non-combustible* roof covering; and

(C) any insulation installed in the cavity of the wall is *non-combustible*; and

(D) any construction joint, space or the like between the top of the wall and the floor, ceiling or roof is smoke sealed with intumescent putty or other suitable material; and

(E) any doorway in the wall is protected by a *self-closing*, tight fitting, solid core door not less than 35 mm thick.

4. TYPE B FIRE-RESISTING CONSTRUCTION

4.1 Fire-resistance of building elements

In a building *required* to be of Type B construction—

(a) each building element listed in **Table 4**, and any beam or column incorporated in it, must have an FRL not less than that listed in the Table for the particular Class of building concerned; and

(b) the *external walls*, *common walls*, and the flooring and floor framing in any lift pit, must be *non-combustible*; and

(c) if a stair *shaft* supports any floor or a structural part of it—

(i) the floor or part must have an FRL of 60/–/– or more; or

(ii) the junction of the stair *shaft* must be constructed so that the floor or part will be free to sag or fall in a fire without causing structural damage to the *shaft*; and

(d) any *internal wall* which is *required* to have an FRL with respect to *integrity* and *insulation*, except a wall that bounds a *sole-occupancy unit* in the topmost (or only) *storey* and there is only one unit in that *storey*, must extend to—

(i) the underside of the floor next above if that floor has an FRL of at least 30/30/30; or

(ii) the underside of a ceiling having a *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes; or

(iii) the underside of the roof covering if it is *non-combustible* and, except for roof battens with dimensions of 75 mm x 50 mm or less or *sarking-type material*, must not be crossed by timber or other *combustible* building elements; or

(iv) 450 mm above the roof covering if it is *combustible*; and

(e) a *loadbearing internal wall* and a *loadbearing fire wall* (including those that are part of a *loadbearingshaft*) must be of concrete or masonry; and

(f) a non-*loadbearing internal wall required* to be *fire-resisting* must be of *non-combustible* construction; and

(g) in a Class 5, 6, 7, 8 or 9 building, in the *storey* immediately below the roof, internal columns and *internal walls* other than *fire walls* and *shaft* walls, need not comply with **Table 4**; and

(h) lift, subject to **C2.10**, ventilating, pipe, garbage, and similar *shafts* which are not for the discharge of hot products of combustion and not *loadbearing*, must be of *non-combustible* construction in—

(i) a Class 2, 3 or 9 building; and

(ii) a Class 5, 6, 7 or 8 building if the *shaft* connects more than 2 *storeys*; and

(i) in a Class 2 or 3 building, except where within the one *sole-occupancy unit*, or a Class 9a *health-care building* or a Class 9b building, a floor separating *storeys* or above a space for the accommodation of motor vehicles or used for storage or any other ancillary purpose, must—

(i) be constructed so that it is at least of the standard achieved by a floor/ceiling system incorporating a ceiling which has a *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes; or

(ii) have an FRL of at least 30/30/30; or

(iii) have a *fire-protective covering* on the underside of the floor, including beams incorporated in it, if the floor is *combustible* or of metal; and

(j) in a Class 9c *aged care building* a floor above a space for the accommodation of motor vehicles or used for storage or any other ancillary purpose, and any column supporting the floor must—

(i) be constructed so that it is at least of the standard achieved by a floor/ceiling system incorporating a ceiling which has a *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes; or

(ii) have an FRL of at least 30/30/30; or

(iii) have a *fire-protective covering* on the underside of the floor, including beams incorporated in it, if the floor is *combustible* or of metal.

Table 4 TYPE B CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building—FRL: (in minutes) *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 8**
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—				
For *loadbearing* parts—				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 30	120/ 90/ 60	180/120/ 90	240/180/120
3 to less than 9 m	90/ 30/ 30	120/ 30/ 30	180/ 90/ 60	240/ 90/ 60
9 to less than 18 m	90/ 30/–	120/ 30/–	180/ 60/–	240/ 60/–
18 m or more	–/–/–	–/–/–	–/–/–	–/–/–
For non-*loadbearing* parts—				
less than 1.5 m	–/ 90/ 90	–/120/120	–/180/180	–/240/240
1.5 to less than 3 m	–/ 60/ 30	–/ 90/ 60	–/120/ 90	–/180/120
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*, where the distance from any *fire-source feature* to which it is exposed is—				
less than 3 m	90/–/–	120/–/–	180/–/–	240/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90 / 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
Fire-resisting lift and stair *shafts*—				
Loadbearing	90/ 90/ 90	120/120/120	180/120/120	240/120/120
Fire-resisting stair *shafts*				
Non-*loadbearing*	–/ 90/ 90	–/120/120	–/120/120	–/120/120
Bounding *public corridors*, public lobbies and the like—				
Loadbearing	60/ 60/ 60	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—				
Loadbearing	60/ 60/ 60	120/–/–	180/–/–	240/–/–
Non-*loadbearing*	–/ 60/ 60	–/–/–	–/–/–	–/–/–
OTHER LOADBEARING INTERNAL WALLS and COLUMNS—	60/–/–	120/–/–	180/–/–	240/–/–

Table 4 TYPE B CONSTRUCTION: FRL OF BUILDING ELEMENTS (Continued)

Building element	Class of building—FRL: (in minutes) *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
ROOFS	–/–/–	–/–/–	–/–/–	–/–/–

4.2 Carparks

(a) Notwithstanding **Clause 4.1**, a *carpark* may comply with **Table 4.2** if it is an *open-deck carpark* or is protected with a sprinkler system complying with **Specification E1.5** and is—

(i) a separate building; or

(ii) a part of a building, and if occupying only part of a *storey*, is separated from the remaining part by a *fire wall*.

(b) For the purposes of this clause, a *carpark*—

(i) includes—

(A) an administration area associated with the functioning of the *carpark*; and

(B) where the *carpark* is sprinklered, is associated with a Class 2 or 3 building and provides carparking for separate *sole-occupancy units*, each carparking area with an area not greater than 10% of its *floor area* for purposes ancillary to the *sole-occupancy units*; but

(ii) excludes—

(A) except for **(b)(i)**, any area of another classification, or other part of a Class 7 building not used for carparking; and

(B) a building or part of a building specifically intended for the parking of trucks, buses, vans and the like.

Table 4.2 REQUIREMENTS FOR CARPARKS

Building element			**FRL (not less than)** ***Structural adequacy/Integrity/ Insulation*** **ESA/M (not greater than)**
Wall			
(a)	*external wall*		
	(i)	less than 3 m from a *fire-source feature* to which it is exposed:	
		Loadbearing	60/60/60
		Non-*loadbearing*	–/60/60
	(ii)	3 m or more from a *fire-source feature* to which it is exposed	–/–/–
(b)	*internal wall*		
	(i)	*loadbearing*, other than one supporting only the roof (not used for carparking)	60/–/–
	(ii)	supporting only the roof (not used for carparking)	–/–/–
	(iii)	non-*loadbearing*	–/–/–
(c)	*fire wall*		
	(i)	from the direction used as a *carpark*	60/60/60
	(ii)	from the direction not used as a *carpark*	as *required* by **Table 4**
Column			
(a)	supporting only the roof (not used for carparking) and 3 m or more from a *fire-source feature* to which it is exposed		–/–/–
(b)	steel column, other than one covered by (a)		60/–/– or 26 m^2/ tonne
(c)	any other column not covered by (a) or (b)		60/–/–
Beam			
(a)	less than 3 m from a *fire-source feature*:		
	(i)	steel floor beam in continuous contact with a concrete floor slab	60/–/– or 30 m^2/ tonne
	(ii)	any other beam	60/–/–
(b)	3 m or more from a *fire-source feature*		–/–/–
Lift shaft			–/–/–
Fire-resisting stair shaft (within the *carpark* only)			60/60/60

Table 4.2 REQUIREMENTS FOR CARPARKS (Continued)

Building element	**FRL (not less than)** ***Structural adequacy/Integrity/ Insulation*** **ESA/M (not greater than)**
Roof, floor slab and vehicle ramp	–/–/–
Note: ESA/M means the ratio of exposed surface area to mass per unit length.	

4.3 Class 2 buildings: Concession

(a) A Class 2 building having a *rise in storeys* of not more than 2 need not comply with **Clause 4.1(b)**, **(e)**, **(f)** and **(h)** of Specification C1.1 if it is constructed using—

(i) timber framing throughout; or

(ii) *non-combustible* material throughout; or

(iii) a combination of **(i)** and **(ii)**,

provided—

(iv) * * * * *

(v) any insulation installed in the cavity of a wall *required* to have an FRL is *non-combustible*; and

(vi) the building is fitted with an *automatic* smoke alarm system complying with **Specification E2.2a**.

(b) A Class 2 building having a *rise in storeys* of not more than 2 may have the top *storey* constructed in accordance with **(a)** provided—

(i) the lowest *storey* is used solely for the purpose of parking motor vehicles or for some other ancillary purpose; and

(ii) the lowest *storey* is constructed of concrete or masonry including the floor between it and the Class 2 part of the building above; and

(iii) the lowest *storey* and the *storey* above are separated by construction having an FRL of not less than 90/90/90 with no openings or penetrations that would reduce the *fire-resisting* performance of that construction except that a doorway in that construction may be protected by a –/60/30 *self-closing* fire door.

(c) In a Class 2 building complying with **(a)** or **(b)** and fitted with a sprinkler system complying with **Specification E1.5**, any FRL criterion prescribed in **Table 4**—

(i) for any *loadbearing* wall, may be reduced to 60, except any FRL criterion of 90 for an *external wall* must be maintained when tested from the outside; and

(ii) for any non-*loadbearing internal wall*, need not apply, if—

(A) it is lined on both sides with 13 mm standard grade plasterboard or similar *non-combustible* material; and

(B) it extends—

(aa) to the underside of the floor next above if that floor has an FRL of at least 30/30/30 or is lined on the underside with a *fire-protective covering*; or

(bb) to the underside of a ceiling with a *resistance to the incipient spread of fire* of 60 minutes; or

(cc) to the underside of a *non-combustible* roof covering; and

(C) any insulation installed in the cavity of the wall is *non-combustible*; and

(D) any construction joints, spaces and the like between the top of the wall and the floor, ceiling or roof is smoke sealed with intumescent putty or other suitable material.

5. TYPE C FIRE-RESISTING CONSTRUCTION

5.1 Fire-resistance of building elements

In a building *required* to be of Type C construction—

(a) a building element listed in **Table 5** and any beam or column incorporated in it, must have an FRL not less than that listed in the Table for the particular Class of building concerned; and

(b) an *external wall* that is *required* by **Table 5** to have an FRL need only be tested from the outside to satisfy the requirement; and

(c) a *fire wall* or an *internal wall* bounding a *sole-occupancy unit* or separating adjoining units must comply with **Specification C1.8** if it is of *lightweight construction* and is *required* to have an FRL; and

(d) in a Class 2 or 3 building, an *internal wall* which is *required* by **Table 5** to have an FRL must extend—

(i) to the underside of the floor next above if that floor has an FRL of at least 30/30/30 or a *fire-protective covering* on the underside of the floor; or

(ii) to the underside of a ceiling having a *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes; or

(iii) to the underside of the roof covering if it is *non-combustible*, and except for roof battens with dimensions of 75 mm x 50 mm or less or *sarking-type material*, must not be crossed by timber or other *combustible* building elements; or

(iv) 450 mm above the roof covering if it is *combustible*; and

(e) in a Class 2 or 3 building, except where within the one *sole-occupancy unit*, or a Class 9a *health-care building*, or a Class 9b building, a floor separating *storeys*, or above a space for the accommodation of motor vehicles or used for storage or any other ancillary purpose, and any column supporting the floor, must—

(i) have an FRL of at least 30/30/30; or

(ii) have a *fire-protective covering* on the underside of the floor including beams incorporated in it and around the column, if the floor or column is *combustible* or of metal; and

(f) in a Class 9c *aged care building* a floor above a space for the accommodation of motor vehicles or used for storage or any other ancillary purpose, and any column supporting the floor, must—

(i) have an FRL of at least 30/30/30; or

(ii) have a *fire-protective covering* on the underside of the floor including beams incorporated in it and around the column, if the floor or column is *combustible* or of metal.

Table 5 TYPE C CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	**Class of building—FRL: (in minutes)** ***Structural adequacy/Integrity/Insulation***			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 8**
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—				
Less than 1.5 m	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
1.5 to less than 3 m	–/–/–	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*, where the distance from any *fire-source feature* to which it is exposed is—				
Less than 1.5 m	90/–/–	90/–/–	90/–/–	90/–/–
1.5 to less than 3 m	–/–/–	60/–/–	60/–/–	60/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
INTERNAL WALLS-				
Bounding *public corridors*, public lobbies and the like—	60/ 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—	60/ 60/ 60	–/–/–	–/–/–	–/–/–
Bounding a stair if *required* to be rated—	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
ROOFS	–/–/–	–/–/–	–/–/–	–/–/–

5.2 Carparks

(a) Notwithstanding **Clause 5.1**, a *carpark* may comply with **Table 5.2** if it is an *open-deck carpark* or is protected with a sprinkler system complying with **Specification E1.5** and is—

(i) a separate building; or

(ii) a part of a building, and if occupying only part of a *storey*, is separated from the remaining part by a *fire wall*.

(b) For the purposes of this clause, a *carpark*—

(i) includes—

(A) an administration area associated with the functioning of the *carpark*; and

(B) where the *carpark* is sprinklered, is associated with a Class 2 or 3 building and provides carparking for separate *sole-occupancy units*, each carparking area with an area not greater than 10% of its *floor area* for purposes ancillary to the *sole-occupancy units*; but

(ii) excludes—

(A) except for **(b)(i)**, any area of another classification, or other part of a Class 7 building not used for carparking; and

(B) a building or part of a building specifically intended for the parking of trucks, buses, vans and the like.

Table 5.2 REQUIREMENTS FOR CARPARKS

Building element	**FRL (not less than)** ***Structural adequacy/Integrity/ Insulation*** **ESA/M (not greater than)**
Wall	
(a) *external wall*	
(i) less than 1.5 m from a *fire-source feature* to which it is exposed:	
Loadbearing	60/60/60
Non-*loadbearing*	–/60/60
(ii) 1.5 m or more from a *fire-source feature* to which it is exposed	–/–/–
(b) *internal wall*	–/–/–
(c) *fire wall*	
(i) from the direction used as a *carpark*	60/60/60
(ii) from the direction not used as a *carpark*	90/90/90

Table 5.2 REQUIREMENTS FOR CARPARKS (Continued)

Building element	FRL (not less than) *Structural adequacy/Integrity/ Insulation* **ESA/M (not greater than)**
Column	
(a) steel column less than 1.5 m from a *fire-source feature*	60/–/– or 26 m^2/tonne
(b) any other column less than 1.5 m from a *fire-source feature*	60/–/–
(c) any other column not covered by (a) or (b)	–/–/–
Beam	
(a) less than 1.5 m from a *fire-source feature*	
(i) steel floor beam in continuous contact with a concrete floor slab	60/–/– or 30 m^2/tonne
(ii) any other beam	60/–/–
(b) 1.5 m or more from a *fire-source feature*	–/–/–
Roof, floor slab and vehicle ramp	–/–/–
Note: ESA/M means the ratio of exposed surface area to mass per unit length.	

SPECIFICATION C1.8 STRUCTURAL TESTS FOR LIGHTWEIGHT CONSTRUCTION

Deemed-to-Satisfy Provisions

1. Scope

This Specification describes tests to be applied to and criteria to be satisfied by a wall system of *lightweight construction*.

2. Application

A wall system need not be tested in accordance with this Specification for static pressure or impact if it is designed and constructed in accordance with the *Deemed-to-Satisfy Provisions* of **Section B** to resist the appropriate pressures and impacts defined in this Specification.

3. Tests

3.1 Walls of certain Class 9b buildings

Lightweight construction forming—

(a) a wall of a lift *shaft* and stair *shaft*; and

(b) an *external* and *internal wall* bounding a *public corridor*, public lobby or the like, including a *fire-isolated* and non *fire-isolated passageway* or *ramp*,

in a spectator stand, sports stadium, cinema or theatre, railway or bus station or airport terminal, must be subjected to the following tests and must fulfil the following criteria:

(i) The materials tests of **Clause 5(a)** and the criteria of **Clause 6(a)**.

(ii) A static test by the imposition of a uniformly distributed load of 1.0 kPa (or its equivalent) in accordance with **Clause 5(b)** and the damage and deflection criteria of **Clauses 6(b)** and **(c)** respectively.

(iii) A dynamic test by the fall of the impact bag through a height of 350 mm in accordance with **Clause 5(c)** and the damage and deflection criteria of **Clauses 6(b)** and **(d)** respectively.

(iv) The surface indentation test of **Clause 5(d)** and the surface indentation criterion of **Clause 6(e)**.

3.2 Walls of shafts and fire-isolated exits generally

A wall of *lightweight construction* that is *required* to be *fire-resisting* and which bounds a lift *shaft*, stair *shaft*, or service *shaft*, *fire-isolated passageway* or *fire-isolated ramp* must be subjected to the following tests and must fulfil the following criteria:

(a) The materials tests of **Clause 5(a)** and the criteria of **Clause 6(a)**.

(b) A static test by the imposition of a uniformly distributed load of 0.35 kPa (or its equivalent) in accordance with **Clause 5(b)** and the damage and deflection criteria of **Clauses 6(b)** and **(c)** respectively.

(c) A dynamic test by the fall of the impact bag through a height of 150 mm in accordance with **Clause 5(c)** and the damage and deflection criteria of **Clauses 6(b)** and **(d)** respectively.

(d) The surface indentation test of **Clause 5(d)** and the surface indentation criterion of **Clause 6(e)**.

3.3 Additional requirements for lift shafts

(a) In addition to the requirements of **Clauses 3.1** and **3.2**, a wall system for use in a lift *shaft* that is *required* to be *fire-resisting* must be subjected to dynamic test by the imposition of—

(i) where the lift car speed is 7 m/s or less — 10^6 cycles of a uniformly distributed load between 0 and 0.2 kPa (or its equivalent); or

(ii) where the lift car speed is greater than 7 m/s — 10^6 cycles of a uniformly distributed load between 0 and 0.35 kPa (or its equivalent) in accordance with **Clause 5(e)** and must fulfil the damage criteria of **Clause 6(b)**.

(b) The wall system must be subjected to the static test in accordance with **Clause 3.2(b)** after the successful conclusion of the dynamic test specified in **(a)**.

3.4 Walls generally

An *external* and *internal wall* of *lightweight construction* that is *required* to be *fire-resisting*, other than one covered by **Clauses 3.1**, **3.2** or **3.3**, must be subjected to the following tests and must fulfil the following criteria:

(a) The materials tests of **Clause 5(a)** and the criteria of **Clause 6(a)**.

(b) A static test by the imposition of a uniformly distributed load of 0.25 kPa (or its equivalent) in accordance with **Clause 5(b)** and the damage and deflection criteria of **Clauses 6(b)** and **(c)** respectively.

(c) A dynamic test by fall of the impact bag through a height of 100 mm in accordance with **Clause 5(c)** and the damage and deflection criteria of **Clauses 6(b)** and **(d)** respectively.

(d) The surface indentation test of **Clause 5(d)** and the surface indentation criterion of **Clause 6(e)**.

4. Test specimens

4.1 General

Testing must be carried out on either—

(a) construction in-situ; or

(b) a laboratory specimen of the construction.

4.2 Testing in-situ

If testing is carried out in-situ, it must be done on that part of the construction least likely, because of the particular combination of the height of the walls, the support conditions and other aspects of the construction, to resist the loads.

4.3 Testing of specimens

If a laboratory specimen is tested, the specimen must span only in the direction corresponding to the height of the wall and testing must be done in accordance with either **(a)** or **(b)** below:

(a)

(i) The height of the test specimen (or length, if the specimen is tested horizontally) must be identical with the height between supports in the actual construction; and

(ii) the specimen must be supported at the top and bottom (or at each end if tested horizontally) by components identical with, and in a manner identical with, the actual construction.

(b) If the distance between supports of the actual construction is more than 3 m, then a smaller specimen may be tested but—

(i) the distance between supports must be not less than 3 m; and

(ii) forces, reactions and support conditions must be modelled so as to reproduce the behaviour of the actual construction if it were tested in-situ.

5. Test methods

Tests must be carried out in accordance with the following:

(a) **Material tests** — The methods specified for the constituent materials of the construction of the standards adopted by reference in the BCA.

(b) **For resistance to static pressure** — The provisions for testing walls under transverse load in ASTM E72-80, except that—

(i) support conditions must be as specified in **Clause 4.3**; and

(ii) equivalent load shall mean the quarter-point load that produces the same deflection or central moment as appropriate.

(c) **For resistance to impact** — The provisions for testing wall systems in ASTM E695-79, except that—

(i) the point of impact must be set 1.5 m above finished floor level or 1.5 m above the part of the specimen that corresponds to finished floor level; and

(ii) the impact bag must be not less than 225 mm in diameter and not more than 260 mm in diameter and have a mass of not less than 27.2 or more than 27.3 kg; and

(iii) the mass must be achieved by putting loose, dry sand into the bag and must be adjusted before each series of impact tests; and

(iv) where the impact bag and suspension cannot be vertical at the instant of impact on a curved surface or an inclined surface, the height of drop is the net height at the point of impact.

(d) **For resistance to surface indentation** — The test for resistance to surface indentation must be carried out at three points on the surface of an undamaged sample sheet as follows:

(i) A steel ball of 10 mm diameter with a load of 150 N must be placed gently on the surface of the sheet and allowed to remain in position for 5 minutes.

(ii) The ball and load must then be removed and the diameter of each impression of the ball on the surface measured.

(e) **For resistance of lift shaft construction to repetitive load** — As for **5(b)** except that—

(i) it is sufficient to test one specimen with the pressure applied from the side of the construction on which the lift will operate; and

(ii) the load must be applied dynamically at a frequency not less than 1 Hz and not more than 3 Hz; and

(iii) equivalent load shall mean the quarter-point load that produces the same central moment as the distributed load.

6. Criteria for compliance

The wall system or the specimen of it must fulfil the following criteria:

(a) **Materials** — Materials must comply with the applicable standard adopted by reference in the BCA.

(b) **Damage** — There must be no crack, penetration or permanent surface-deformation to a depth of more than 0.5 mm or any other non-elastic deformation or fastener failure.

(c) **Deflection — Static pressure** — Under static pressure the deflection must not be more than—

(i) 1/240th of the height between supports; or

(ii) for construction other than a lift *shaft* — 30 mm; or

(iii) for a lift *shaft* — 20 mm unless the requirements of clause 15.2(a) of AS 1735.2 or clause A3.10 of Appendix A of AS 1735.1 are fulfilled.

(d) **Deflection — Impact** — Under impact the instantaneous deflection must not be more than—

(i) 1/120th of the height of the wall between supports; or

(ii) for construction other than a lift *shaft* — 30 mm; or

(iii) for a lift *shaft* — 20 mm unless the requirements of clause 15.2(a) of AS 1735.2 are fulfilled.

(e) **Surface indentation** — No impression must be more than 5 mm in diameter.

SPECIFICATION C1.10 FIRE HAZARD PROPERTIES

Deemed-to-Satisfy Provisions

1. Scope

This Specification sets out requirements in relation to the *fire hazard properties* of linings, materials and assemblies in Class 2 to 9 buildings as set out in **Table 1**.

2. Application

Linings, materials and assemblies in Class 2 to 9 buildings must comply with the appropriate provisions described in **Table 1**.

Table 1 FIRE HAZARD PROPERTY REQUIREMENTS

Lining, material or assembly	Requirement
Floor linings and floor coverings.	**Clause 3**
Wall linings and ceiling linings.	**Clause 4**
Air-handling ductwork.	**Clause 5**
Lift cars.	**Clause 6**
In fire control rooms subject to **Specification E1.8** and fire isolated *exits*	**Clause 7**
In Class 9b buildings used as a theatre, public hall or the like— (a) fixed seating in the audience area or auditorium; and (b) a proscenium curtain *required* by **Specification H1.3**.	
Escalators, moving walkways and non-*required* non-*fire-isolated stairways* or pedestrian ramps subject to **Specification D1.12**.	
Sarking-type material.	
Attachments to internal floors, walls and ceilings.	
Other materials including Insulation.	

3. Floor linings and floor coverings

A floor lining or floor covering must have—

(a) a *critical radiant flux* not less than that listed in **Table 2**; and

(b) in a building not protected by a sprinkler system complying with **Specification E1.5**, a maximum *smoke development rate* of 750 percent-minutes; and

(c) a group number complying with **Clause 6(a)(ii)**, for any portion of the floor covering that is continued more than 150 mm up a wall.

Deemed-to-Satisfy Provisions

Table 2 CRITICAL RADIANT FLUX (CRF in kW/m^2) OF FLOOR MATERIALS AND FLOOR COVERINGS

Class of building	General		Fire-isolated exits and fire control rooms
	Building not fitted with a sprinkler system complying with Specification E1.5	Building fitted with a sprinkler system complying with Specification E1.5	
Class 2, 3, 5, 6, 7, 8 or 9b, excluding— (i) Class 3 accommodation for the aged, and (ii) Class 9b as specified below.	2.2	1.2	2.2
Class 3 Accommodation for the aged.	4.5	2.2	4.5
Class 9a *Patient care areas.*	4.5	2.2	4.5
Areas other than *patient care areas.*	2.2	1.2	4.5
Class 9b auditorium or audience seating area used mainly for— (i) indoor swimming or ice skating; and	1.2	1.2	2.2
(ii) other sports or multi-purpose functions.	2.2	1.2	2.2
Class 9c *Resident use areas.*	—	2.2	4.5
Areas other than *resident use areas.*	—	1.2	4.5

4. Wall and ceiling linings

(a) For the purposes of this Clause, the *group number* of a material is determined by either—

(i) physical testing in accordance with AS ISO 9705; or

(ii) prediction in accordance with **Clause 3 of Specification A2.4** using data obtained by testing the material at 50 kW/m^2 irradiance in the horizontal orientation with edge frame in accordance with AS/NZS 3837.

(b) The *group number* of a material is as follows when tested or predicted in accordance with sub-clause **(a)**:

Deemed-to-Satisfy Provisions

(i) A Group 1 material is one that does not reach *flashover* when exposed to 100 kW for 600 seconds followed by exposure to 300 kW for 600 seconds.

(ii) A Group 2 material is one that reaches *flashover* following exposure to 300 kW within 600 seconds after not reaching *flashover* when exposed to 100 kW for 600 seconds.

(iii) A Group 3 material is one that reaches *flashover* in more than 120 seconds but within 600 seconds when exposed to 100 kW.

(iv) A Group 4 material is one that reaches *flashover* within 120 seconds when exposed to 100 kW.

(c) A material used as a finish, surface, lining or attachment to a wall or ceiling must be a Group 1, Group 2 or Group 3 material used in accordance with **Table 3** and for buildings not fitted with a sprinkler system complying with **Specification E1.5**, have—

(i) a *smoke growth rate index* not more than 100; or

(ii) an *average specific extinction area* less than 250 m^2/kg.

Table 3 WALL AND CEILING LINING MATERIALS (Material Groups permitted)

Class of building	Fire-isolated exits and fire control rooms	Public corridors		Specific areas		Other areas
	Wall/ceiling	Wall	Ceiling	Wall	Ceiling	Wall/ceiling
Class 2 or 3						
Excluding accommodation for the aged, people with disabilities, and children						
Unsprinklered	1	1, 2	1, 2	1, 2, 3	1, 2, 3	1, 2, 3
Sprinklered	1	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3
Class 3 or 9a						
Accommodation for the aged, people with disabilities, children and *health-care buildings*						
Unsprinklered	1	1	1	1, 2	1, 2	1, 2, 3
Sprinklered	1	1, 2	1, 2	1, 2, 3	1, 2, 3	1, 2, 3
Class 5, 6, 7, 8 or 9b *schools*						
Unsprinklered	1	1, 2	1, 2	1, 2, 3	1, 2	1, 2, 3
Sprinklered	1	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3
Class 9b other than *schools*						
Unsprinklered	1	1	1	1, 2	1, 2	1, 2, 3
Sprinklered	1	1, 2	1, 2	1, 2, 3	1, 2, 3	1, 2, 3
Class 9c						
Sprinklered	1	1, 2	1, 2	1, 2, 3	1, 2, 3	1, 2, 3

Deemed-to-Satisfy Provisions

Table 3 WALL AND CEILING LINING MATERIALS (Material Groups permitted) (Continued)

Class of building	Fire-isolated exits and fire control rooms	Public corridors		Specific areas		Other areas
	Wall/ceiling	Wall	Ceiling	Wall	Ceiling	Wall/ceiling
For the purpose of this Table— 1. "Sprinklered" means a building fitted with a sprinkler system complying with **Specification E1.5**. 2. "Specific areas" means within— (a) for Class 2 and 3 buildings, a *sole-occupancy unit*; and (b) for Class 5 buildings, open plan offices with a minimum floor dimension/floor to ceiling height ratio > 5; and (c) for Class 6 buildings, shops or other building with a minimum floor dimension/floor to ceiling height ratio > 5; and (d) for Class 9a *health-care buildings*, *patient care areas*; and (e) for Class 9b theatres and halls, etc, an auditorium; and (f) for Class 9b *schools*, a classroom; and (g) for Class 9c *aged care buildings*, *resident use areas*.						

5. Air-handling ductwork

Rigid and flexible ductwork in a Class 2 to 9 building must comply with the *fire hazard properties* set out in AS 4254.

6. Lift cars

(a) Materials used as—

(i) floor linings and floor coverings must have a *critical radiant flux* not less than 2.2; and

(ii) wall and ceiling linings must be a Group 1 material or a Group 2 material in accordance with **Clause 4(b)**.

(b) Materials, other than those referenced in **(a)**, used in the construction of a lift car in a Class 2 to 9 building must comply with the *fire hazard properties required* by AS 1735.2.

7. Other materials

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Materials and assemblies in a Class 2 to 9 building not included in **Clauses 3**, **4**, **5** or **6** must not exceed the indices set out in **Table 4**.

Deemed-to-Satisfy Provisions

Table 4 OTHER MATERIALS

Material or assembly location	Flammability Index	Spread-of-Flame Index	Smoke-Developed Index
Fire control rooms subject to **Specification E1.8** and fire-isolated *exits*, other than a *sarking-type material* used in a ceiling or used as an attachment or part of an attachment to a building element. Note 1	—	0	2
Class 9b buildings used as a theatre, public hall or the like:			
(a) Any part of fixed seating in the audience area or auditorium.	—	0	5
(b) A proscenium curtain *required* by **Specification H1.3**.	—	0	3
Escalators, moving walkways or non-*required* non-*fire-isolated stairways* or pedestrian ramps subject to **Specification D1.12**.	—	0	5
Sarking-type material:			
(a) In a fire control room subject to **Specification E1.8** or a fire-isolated *exit* or fire control room used in the form of an exposed wall or ceiling.	0	—	—
(b) In other locations. Note 2	5	—	—
Other materials or locations and insulation materials other than *sarking-type materials*. Notes 2 and 3	—	9	8 if the *Spread-of-Flame Index* is more than 5

Notes:

1. In a fire control room or *fire-isolated stairway*, a material used as an attachment or part of an attachment to a building element must, if *combustible*, be attached directly to a *non-combustible* substrate and not exceed 1 mm finished thickness.
2. A material, other than one located within a fire-isolated *exit* or fire control room, may be covered on all faces by concrete or masonry not less than 50 mm thick, as an alternative to meeting the specified indices.
3. In the case of a composite member or assembly, the member or assembly must be constructed so that when assembled as proposed in a building—
   (a) any material which does not comply with this Table is protected on all sides and edges from exposure to the air; and

Deemed-to-Satisfy Provisions

Table 4 OTHER MATERIALS (Continued)

Material or assembly location	Flammability Index	Spread-of-Flame Index	Smoke-Developed Index
(b) the member or assembly, when tested in accordance with **Specification A2.4**, has a *Spread-of-Flame Index* and a *Smoke-Developed Index* not exceeding those prescribed in this Table; and (c) the member or assembly retains the protection in position so that it prevents ignition of the material and continues to screen it from access to free air for a period of not less than 10 minutes.			

SPECIFICATION C1.11 PERFORMANCE OF EXTERNAL WALLS IN FIRE

Deemed-to-Satisfy Provisions

1. Scope

This Specification contains measures to minimise, in the event of fire, the likelihood of *external walls* covered by **Clause 2** collapsing outwards as complete panels and the likelihood of panels separating from supporting members.

2. Application

This Specification applies to buildings having a *rise in storeys* of not more than 2 with concrete *external walls* that could collapse as complete panels (eg. tilt-up and precast concrete) which—

(a) consist of either single or multiple panels attached by steel connections to lateral supporting members; and

(b) depend on those connections to resist outward movement of the panels relative to the supporting members; and

(c) have height to thickness ratio not greater than 50.

3. General requirements for external wall panels

(a) Cast-in inserts and fixings must be anchored into the panel with welded bars or be fixed to the panel reinforcement.

(b) Cast-in inserts for top connections and fixings acting together must be able to resist an ultimate load of two times the larger of the forces *required* to develop—

(i) the ultimate bending moment capacity of the panel at its base; or

(ii) the overturning moment at the base of the panel arising from an outwards lateral displacement at the top of the panel equal to one tenth of the panel height.

(c) Top connections of the panel exposed to fire, such as clips and drilled-in inserts, acting together must be able to resist an ultimate load of six times the larger of the forces *required* to develop the moment specified in **(b)(i)** or **(ii)**.

Note.

The increased forces specified by use of the multiplier of two or six in **(b)** and **(c)** above are to take account of the lower strength of the connections and members at the higher than ambient temperatures expected in a fire.

(d) Lateral supporting members and their connections must be designed to resist the connection forces specified in **(b)** and **(c)** and in the case of an eaves tie member the force in the member must be determined assuming that it deforms in a manner

compatible with the lateral displacement of the wall panels, and that it acts in tension only.

(e) *External wall* panels that span vertically must have at least two upper connections per panel to the supporting member, except that where a number of panels are designed to act as one unit, (eg. tongue and groove hollow-core panels), only two upper connections are *required* for each unit.

(f) *External wall* panels that span horizontally between columns must have at least two connections at each column.

(g) Connections providing lateral support to a panel must be designed to remain engaged to the supported panel both before and during a fire.

4. Additional requirements for vertically spanning external wall panels adjacent to columns

(a) Where vertically spanning *external wall* panels are located adjacent to columns, connections to the panels must be located and/or detailed to minimise forces that may develop between the panels and columns arising from the restraint of differential displacement.

(b) The requirements of **(a)** are satisfied by—

(i) detailing the connections and/or the supporting member to sustain a relative outward displacement of (d) between the panels and columns at the connection height where d(m) is calculated as—

(A) the square of the connection height (m) divided by one hundred and twenty-five, when the connection height is less than 5 m; or

(B) the connection height (m) divided by twenty-five, when the connection height (m) is greater than or equal to 5 m; or

(ii) in situations where an eaves tie member is used to provide lateral support to *external wall* panels, the tie member is connected to the panels no closer than a distance (s) from the column where s(m) is taken as one quarter of the panel height (m).

SPECIFICATION C2.5 SMOKE-PROOF WALLS IN HEALTH-CARE AND AGED CARE BUILDINGS

Deemed-to-Satisfy Provisions

1. SCOPE

This Specification sets out requirements for the construction of smoke-proof walls in Class 9a *health-care buildings* and Class 9c *aged care buildings*. Smoke proof walls required to have an FRL are to be in accordance with **Clause A2.3**.

2. Class 9a health-care buildings

Smoke-proof walls *required* by **C2.5** in Class 9a *health-care buildings* must comply with the following:

(a) Be *non-combustible* and extend to the underside of—

(i) the floor above; or

(ii) a *non-combustible* roof covering; or

(iii) a ceiling having a *resistance to the incipient spread of fire* to the space above itself of not less than 60 minutes.

(b) Not incorporate any glazed areas unless the glass is safety glass as defined in AS 1288.

(c) Only have doorways which are fitted with smoke doors complying with **Specification C3.4**.

(d) Have all openings around penetrations and the junctions of the smoke-proof wall and the remainder of the building stopped with *non-combustible* material to prevent the free passage of smoke.

(e) Incorporate smoke dampers where air-handling ducts penetrate the wall unless the duct forms part of a smoke hazard management system *required* to continue air movement through the duct during a fire.

3. Class 9c aged care buildings

Smoke-proof walls *required* by **C2.5** in Class 9c *aged care buildings* must comply with the following:

(a) The wall may be lined on one side only.

(b) Linings on the wall must be *non-combustible* and extend to the underside of—

(i) the floor above; or

(ii) a *non-combustible* roof covering; or

(iii) a flush plasterboard ceiling lined with 13 mm standard grade plasterboard or a *fire protective covering* with all penetrations sealed against the free passage of smoke.

(c) If plasterboard is used in the lining on a wall, it must be a minimum of 13 mm standard grade plasterboard.

(d) Not incorporate any glazed areas unless the glass is safety glass as defined in AS 1288.

(e) Only have doorways which are fitted with smoke doors complying with **Specification C3.4**.

(f) Have all openings around penetrations and the junctions of the smoke-proof wall and the remainder of the building stopped with *non-combustible* material to prevent the free passage of smoke.

(g) Incorporate smoke dampers where air-handling ducts penetrate the wall unless the duct forms part of a smoke hazard management system *required* to continue air movement through the duct during a fire.

4. Doorways in smoke-proof walls

A door *required* by **C2.5** or this Specification to be smoke-proof or have an FRL, other than one that serves a *fire compartment* provided with a zone smoke control system in accordance with AS/NZS 1668.1, must provide a smoke reservoir by not extending within 400 mm of the underside of—

(a) a roof covering; or

(b) the floor above; or

(c) an imperforate false ceiling that will prevent the free passage of smoke.

SPECIFICATION C3.4 FIRE DOORS, SMOKE DOORS, FIRE WINDOWS AND SHUTTERS

Deemed-to-Satisfy Provisions

1. SCOPE

This Specification sets out requirements for the construction of fire doors, smoke doors, fire *windows* and fire shutters.

2. FIRE DOORS

A *required* fire door must—

(a) comply with AS 1905.1; and

(b) not fail by radiation through any glazed part during the period specified for *integrity* in the *required* FRL.

3. SMOKE DOORS

3.1 General requirements

Smoke doors must be constructed so that smoke will not pass from one side of the doorway to the other and, if they are glazed, there is minimal danger of a person being injured by accidentally walking into them.

3.2 Construction deemed-to-satisfy

A smoke door of one or two leaves satisfies **Clause 3.1** if it is constructed as follows:

(a) The leaves are side-hung to swing—

(i) in the direction of egress; or

(ii) in both directions.

(b)

(i) The leaves are capable of resisting smoke at 200°C for 30 minutes.

(ii) Solid-core leaves at least 35 mm thick satisfy **(i)**.

(c) The leaves are fitted with smoke seals.

(d)

(i) The leaves are normally in the closed position; or

(ii)

(A) The leaves are closed *automatically* with the *automatic* closing operation initiated by smoke detectors, installed in accordance with the relevant provisions of AS 1670.1, located on each side of the doorway not more than 1.5 m horizontal distance from the doorway; and

Deemed-to-Satisfy Provisions

(B) in the event of power failure to the door, the leaves fail-safe in the closed position.

(e) The leaves return to the fully closed position after each manual opening.

(f) Any glazing incorporated in the door complies with AS 1288.

(g)

(i) If a glazed panel is capable of being mistaken for an unobstructed *exit*, the presence of the glass must be identified by opaque construction.

(ii) An opaque mid-height band, mid-rail or crash bar satisfies **(i)**.

4. FIRE SHUTTERS

A *required* fire shutter must—

(a) be a shutter that—

(i) is identical with a tested prototype that has achieved the *required* FRL; and

(ii) is installed in the same manner and in an opening that is not larger than the tested prototype; and

(iii) did not have a rise in average temperature on the side remote from the furnace of more than 140 K during the first 30 minutes of the test; or

(b) be a steel shutter complying with AS 1905.2 if a metallic fire shutter is not prohibited by **C3.5**.

5. FIRE WINDOWS

A *required* fire *window* must be—

(a) identical in construction with a prototype that has achieved the *required* FRL; and

(b) installed in the same manner and in an opening that is not larger than the tested prototype.

SPECIFICATION C3.15 PENETRATION OF WALLS, FLOORS AND CEILINGS BY SERVICES

Deemed-to-Satisfy Provisions

1. Scope

This Specification prescribes materials and methods of installation for services that penetrate walls, floors and ceilings *required* to have an FRL.

2. Application

(a) This Specification applies to installations permitted under the *Deemed-to-Satisfy Provisions* of the BCA as alternatives to systems that have been demonstrated by test to fulfil the requirements of **C3.15(a)**.

(b) This Specification does not apply to installations in ceilings *required* to have a *resistance to the incipient spread of fire* nor to the installation of piping that contains or is intended to contain a flammable liquid or gas.

3. Metal pipe systems

(a) A pipe system comprised entirely of metal (excluding pipe seals or the like) that is not normally filled with liquid must not be located within 100 mm, for a distance of 2 m from the penetration, of any *combustible* building element or a position where *combustible* material may be located, and must be constructed of—

(i) copper alloy or stainless steel with a wall thickness of at least 1 mm; or

(ii) cast iron or steel (other than stainless steel) with a wall thickness of at least 2 mm.

(b) An opening for a pipe system comprised entirely of metal (excluding pipe seals or the like) must—

(i) be neatly formed, cut or drilled; and

(ii) be no closer than 200 mm to any other service penetration; and

(iii) accommodate only one pipe.

(c) A pipe system comprised entirely of metal (excluding pipe seals or the like) must be wrapped but must not be lagged or enclosed in thermal insulation over the length of its penetration of a wall, floor or ceiling unless the lagging or thermal insulation fulfils the requirements of **Clause 7**.

(d) The gap between a metal pipe and the wall, floor or ceiling it penetrates must be fire-stopped in accordance with **Clause 7**.

Deemed-to-Satisfy Provisions

4. Pipes penetrating sanitary compartments

If a pipe of metal or UPVC penetrates the floor of a *sanitary compartment* in accordance with **C3.15(c)(i)**—

(a) the opening must be neatly formed and no larger than is necessary to accommodate the pipe or fitting; and

(b) the gap between pipe and floor must be fire-stopped in accordance with **Clause 7**.

5. Wires and cables

If a wire or cable or cluster of wires or cables penetrates a floor, wall or ceiling—

(a) the opening must be neatly formed, cut or drilled and no closer than 50 mm to any other service; and

(b) the opening must be no larger in cross-sectional area than—

(i) 2000 mm^2 if only a single cable is accommodated and the gap between cable and wall, floor or ceiling is no wider than 15 mm; or

(ii) 500 mm^2 in any other case; and

(c) the gap between the service and the wall, floor or ceiling must be fire-stopped in accordance with **Clause 7**.

6. Electrical switches and outlets

If an electrical switch, outlet, socket or the like is accommodated in an opening or recess in a wall, floor or ceiling—

(a) the opening or recess must not—

(i) be located opposite any point within 300 mm horizontally or 600 mm vertically of any opening or recess on the opposite side of the wall; or

(ii) extend beyond half the thickness of the wall; and

(b) the gap between the service and the wall, floor or ceiling must be fire-stopped in accordance with **Clause 7**.

7. Fire-stopping

(a) **Material:** The material used for the fire-stopping of service penetrations must be concrete, high-temperature mineral fibre, high-temperature ceramic fibre or other material that does not flow at a temperature below 1120°C when tested in accordance with ISO 540, and must have—

(i) demonstrated in a system tested in accordance with **C3.15(a)** that it does not impair the *fire-resisting* performance of the building element in which it is installed; or

(ii) demonstrated in a test in accordance with **(e)** that it does not impair the *fire-resisting* performance of the test slab.

Deemed-to-Satisfy Provisions

(b) **Installation:** Fire-stopping material must be packed into the gap between the service and wall, floor or ceiling in a manner, and compressed to the same degree, as adopted for testing under **Clause 7(a)(i)** or **(ii)**.

(c) **Hollow construction:** If a pipe penetrates a hollow wall (such as a stud wall, a cavity wall or a wall of hollow blockwork) or a hollow floor/ceiling system, the cavity must be so framed and packed with fire-stopping material that is—

(i) installed in accordance with **Clause 7(b)** to a thickness of 25 mm all round the service for the full length of the penetration; and

(ii) restrained, independently of the service, from moving or parting from the surfaces of the service and of the wall, floor or ceiling.

(d) **Recesses:** If an electrical switch, socket, outlet or the like is accommodated in a recess in a hollow wall or hollow floor/ceiling system—

(i) the cavity immediately behind the service must be framed and packed with fire-stopping material in accordance with **Clause 7(c)**; or

(ii) the back and sides of the service must be protected with refractory lining board identical with and to the same thickness as that in which the service is installed.

(e) **Test:** The test to demonstrate compliance of a fire-stopping material with this Specification must be conducted as follows:

(i) The test specimen must comprise a concrete slab not less than 1 m square and not more than 100 mm thick, and appropriately reinforced if necessary for *structural adequacy* during manufacture, transport and testing.

(ii) The slab must have a hole 50 mm in diameter through the centre and the hole must be packed with the fire-stopping material.

(iii) The slab must be conditioned in accordance with AS 1530.4.

(iv) Two thermocouples complying with AS 1530.4 must be attached to the upper surface of the packing each about 5 mm from its centre.

(v) The slab must be tested on flat generally in accordance with Section 10 of AS 1530.4 and must achieve an FRL of 60/60/60 or as otherwise *required*.

SECTION D

ACCESS AND EGRESS

SECTION D CONTENTS

SECTION D ACCESS AND EGRESS

OBJECTIVE

DO1

The *Objective* of this Section is to—

(a) provide, as far as is reasonable, people with safe, equitable and dignified access to—

(i) a building; and

(ii) the services and facilities within a building; and

(b) safeguard occupants from illness or injury while evacuating in an emergency.

FUNCTIONAL STATEMENTS

DF1

A building is to provide, as far as is reasonable—

(a) safe; and

(b) equitable and dignified,

access for people to the services and facilities within.

Limitation:

DF1(b) does not apply to a Class 4 part of a building.

DF2

A building is to be provided with means of evacuation which allow occupants time to evacuate safely without being overcome by the effects of an emergency.

Limitation:

DF2 does not apply to the internal parts of a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building.

PERFORMANCE REQUIREMENTS

DP1

Access must be provided, to the degree necessary, to enable—

(a) people to—

(i) approach the building from the road boundary and from any *accessible* carparking spaces associated with the building; and

(ii) approach the building from any *accessible* associated building; and

(iii) access work and public spaces, accommodation and facilities for personal hygiene; and

(b) identification of *accessways* at appropriate locations which are easy to find.

Limitation:

DP1 does not apply to a Class 4 part of a building.

DP2

So that people can move safely to and within a building, it must have—

(a) walking surfaces with safe gradients; and

(b) any doors installed to avoid the risk of occupants—

(i) having their egress impeded; or

(ii) being trapped in the building; and

(c) any stairways and ramps with—

(i) slip-resistant walking surfaces on—

(A) ramps; and

(B) stairway treads or near the edge of the nosing; and

(ii) suitable handrails where necessary to assist and provide stability to people using the stairway or ramp; and

(iii) suitable landings to avoid undue fatigue; and

(iv) landings where a door opens from or onto the stairway or ramp so that the door does not create an obstruction; and

(v) in the case of a stairway, suitable safe passage in relation to the nature, volume and frequency of likely usage.

DP3

Where people could fall—

(a) 1 m or more—

(i) from a floor or roof or through an opening (other than through an openable *window*) in the *external wall* of a building; or

(ii) due to a sudden change of level within or associated with a building; or

(b) 4 m or more from a floor through an openable *window*,

a barrier must be provided which must be—

(c) continuous and extend for the full extent of the hazard; and

(d) of a height to protect people from accidentally falling from the floor or roof or through the opening; and

(e) constructed to prevent people from falling through the barrier; and

(f) capable of restricting the passage of children; and

(g) of strength and rigidity to withstand—

(i) the foreseeable impact of people; and

(ii) where appropriate, the static pressure of people pressing against it.

Limitations:

DP3 does not apply where such a barrier would be incompatible with the intended use of an area such as a stage, loading dock or the like.

DP3(f) does not apply to—

(a) *fire-isolated stairways*, *fire-isolated ramps*, and other areas used primarily for emergency purposes, excluding external stairways and external ramps; and

(b) Class 7 (other than *carparks*) and Class 8 buildings and parts of buildings containing those classes.

DP4

Exits must be provided from a building to allow occupants to evacuate safely, with their number, location and dimensions being appropriate to—

(a) the travel distance; and

(b) the number, mobility and other characteristics of occupants; and

(c) the function or use of the building; and

(d) the height of the building; and

(e) whether the *exit* is from above or below ground level.

DP5

To protect evacuating occupants from a fire in the building *exits* must be fire-isolated, to the degree necessary, appropriate to—

(a) the number of *storeys* connected by the *exits*; and

(b) the *fire safety system* installed in the building; and

(c) the function or use of the building; and

(d) the number of *storeys* passed through by the *exits*; and

(e) *fire brigade* intervention.

DP6

So that occupants can safely evacuate the building, paths of travel to exits must have dimensions appropriate to—

(a) the number, mobility and other characteristics of occupants; and

(b) the function or use of the building.

Limitation:

DP6 does not apply to the internal parts of a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building.

DP7

* * * * *

This clause has deliberately been left blank.

DP8

Carparking spaces for use by people with a disability must be—

(a) provided, to the degree necessary, to give equitable access for carparking; and

(b) designated and easy to find.

Limitation:

DP8 does not apply to a building where—

(a) a parking service is provided; and

(b) direct access to any carparking spaces by the general public or occupants is not available.

DP9

An inbuilt communication system for entry, information, entertainment, or for the provision of a service, must be suitable for occupants who are deaf or hearing impaired.

Limitation:

DP9 does not apply to—

(a) a Class 4 part of a building; or

(b) an inbuilt communication system used only for emergency warning purposes.

Tas DP10

VERIFICATION METHOD

DV1 Wire balustrades

Compliance with **DP3(e)** and **(f)** for wire balustrades is verified when the wire balustrade passes the test described below:

(a) **Application**

The test must be carried out on either—

(i) a prototype of a wire balustrade that is identical to that proposed to be installed on-site; or

(ii) a wire balustrade installed on-site.

(b) **Test equipment**

The test equipment must consist of the following:

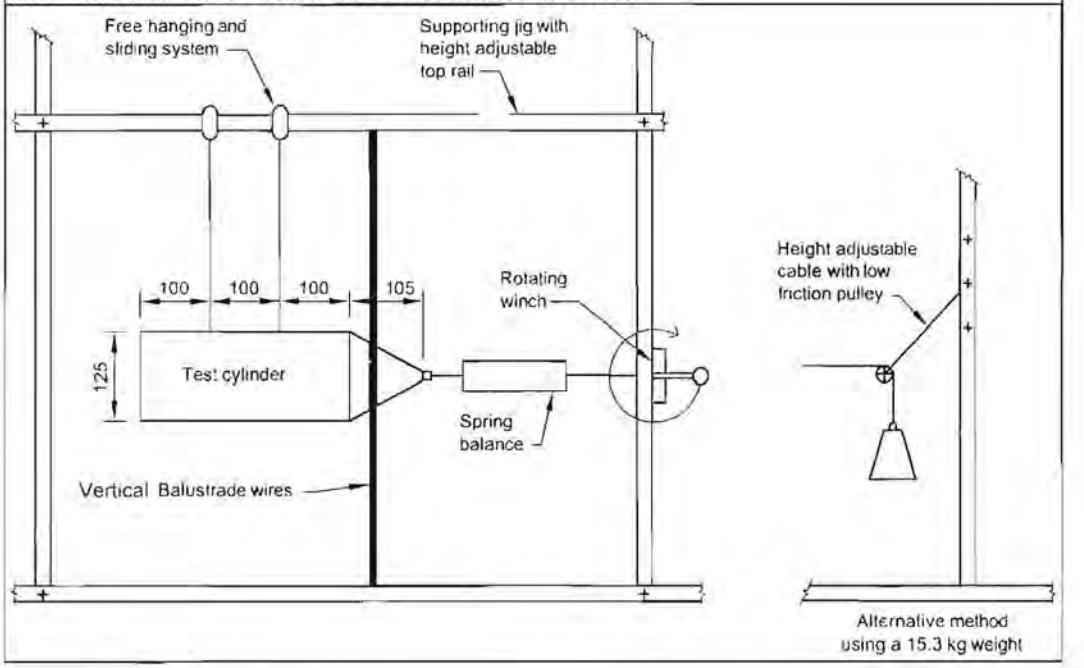
(i) A horizontally suspended 125 mm diameter, 405 mm long cylinder of 1 mm thick steel having a highly polished 105 mm long cone at one end with a 20 mm diameter flat leading edge to which an eye bolt is fixed.

(ii) A sufficiently flexible horizontal cable with mechanisms capable of applying and measuring a tension of 150 N (or a 15.3 kg weight suspended over a low friction pulley) is to be attached to the eye bolt (see **Figure DV1**).

(iii) A mechanism capable of measuring the tension force applied to each balustrade wire.

Figure DV1

APPARATUS FOR TESTING WIRE BALUSTRADES



(c) **Test procedure**

The test procedure must be as follows:

(i) Tension the wires, within their safe load, to the same tension in all wires and measure the tensions with a strain indicator.

(ii) For—

(A) horizontal or near horizontal wires, position the cone against a pair of wires at the mid-span between supports, then apply the 150 N tension force to the cone; and

(B) vertical wires, position the cone against a pair of wires at the mid-span between supporting rails, then apply the 150 N tension force to the cone; and

(C) near-vertical wires, position the cone against a pair of wires at the widest opening between the wires, then apply the 150 N tension force to the cone.

(iii) Attempt to pull the cone through the gap between the wires under the 150 N load, and—

(A) increase the tension in the wires and repeat **(ii)** until such time as the cone will not pull through; or

(B) if it does not pull through, reduce the tension in the wires and repeat step **(ii)**; and

(iv) When the cone is just prevented from pulling through the gap, the wires are at the correct tension in which case the cone is withdrawn and the tension recorded.

(v) Reduce the tension in the wires and repeat steps **(ii)** to **(iv)** twice more, recording the tension in each case after the cone has been removed and then calculate the average of the three tensions as the *required* tension for each wire.

(vi) For prototype tests of horizontal or near horizontal wires, record the deflection of each wire at the average tension calculated in accordance with **(v)** when a 2 kg mass is hung at mid-span between supports.

(d) **Test report**

The test report must include the following information:

(i) The name and address of the person supervising the test.

(ii) The test report number.

(iii) The date of the test.

(iv) The wire manufacturer's name and address, and specifications of the wires used in the test including the safe load limit of the wires.

(v) The construction details of the test specimen, including a description and drawings and details of the components including supports, post or railing spacings and wire spacings.

(vi) For a prototype test, the *required* tension calculated in accordance with **(c)(v)**.

(vii) For prototype tests of horizontal or near horizontal wires, the deflection measured in accordance with **(c)(vi)**.

PART D1 PROVISION FOR ESCAPE

Deemed-to-Satisfy Provisions

D1.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **DP1** to **DP9** are satisfied by complying with—

(i) **D1.1** to **D1.16**, **D2.1** to **D2.23** and **D3.1** to **D3.12**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**; and

(iv) for public transport buildings, **Part H2**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **D1.1** to **D1.16**, **D2.1** to **D2.23** and **D3.1** to **D3.12**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**; and

(iv) for public transport buildings, **Part H2**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

D1.1 Application of Part

The *Deemed-to-Satisfy Provisions* of this Part do not apply to the internal parts of a *sole-occupancy unit* in a Class 2 or 3 building or a Class 4 part of a building.

D1.2 Number of exits required

(a) **All buildings** — Every building must have at least one *exit* from each *storey*.

(b) **Class 2 to 8 buildings** — In addition to any *horizontal exit*, not less than 2 *exits* must be provided from the following:

(i) Each *storey* if the building has an *effective height* of more than 25 m.

(ii) A Class 2 or 3 building subject to **C1.5**.

(c) **Basements** — In addition to any *horizontal exit*, not less than 2 *exits* must be provided from any *storey* if egress from that *storey* involves a vertical rise within the building of more than 1.5 m, unless—

(i) the *floor area* of the *storey* is not more than 50 m^2; and

(ii) the distance of travel from any point on the floor to a single *exit* is not more than 20 m.

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(d) **Class 9 buildings** — In addition to any *horizontal exit*, not less than 2 *exits* must be provided from the following:

(i) Each *storey* if the building has a *rise in storeys* of more than 6 or an *effective height* of more than 25 m.

(ii) Any *storey* which includes a *patient care area* in a Class 9a *health-care building*.

(iii) Any *storey* that contains sleeping areas in a Class 9c *aged care building*.

(iv) Each *storey* in a Class 9b building used as an *early childhood centre*.

(v) Each *storey* in a primary or secondary *school* with a *rise in storeys* of 2 or more.

(vi) Any *storey* or *mezzanine* that accommodates more than 50 persons, calculated under **D1.13**.

NSW D1.2(d)(vii)

(e) **Exits from Class 9c aged care buildings and patient care areas in Class 9a health-care buildings** — In a Class 9a *health-care building* and a Class 9c *aged care building*, at least one *exit* must be provided from every part of a *storey* which has been divided into *fire compartments* in accordance with **C2.2** or **C2.5**.

(f) **Exits in open spectator stands** — In an *open spectator stand* containing more than one tier of seating, every tier must have not less than 2 stairways or ramps, each forming part of the path of travel to not less than 2 *exits*.

(g) **Access to exits** — Without passing through another *sole-occupancy unit* every occupant of a *storey* or part of a *storey* must have access to—

(i) an *exit*; or

(ii) at least 2 *exits*, if 2 or more *exits* are *required*.

D1.3 When fire-isolated stairways and ramps are required

(a) **Class 2 and 3 buildings** — Every stairway or ramp serving as a *required exit* must be fire-isolated unless it connects, passes through or passes by not more than—

(i) 3 consecutive *storeys* in a Class 2 building; or

(ii) 2 consecutive *storeys* in a Class 3 building,

and one extra *storey* of any classification may be included if—

(iii) it is only for the accommodation of motor vehicles or for other ancillary purposes; or

(iv) the building has a sprinkler system complying with **Specification E1.5** installed throughout; or

(v) the *required exit* does not provide access to or egress for, and is separated from, the extra *storey* by construction having—

(A) an FRL of –/60/60, if non-*loadbearing*; and

(B) an FRL of 90/90/90, if *loadbearing*; and

Deemed-to-Satisfy Provisions

(C) no opening that could permit the passage of fire or smoke.

(b) **Class 5 to 9 buildings** — Every stairway or ramp serving as a *required exit* must be fire-isolated unless—

(i) in a Class 9a *health-care building* — it connects, or passes through or passes by not more than 2 consecutive *storeys* in areas other than *patient care areas*; or

(ii) it is part of an *open spectator stand*; or

(iii) in any other case except in a Class 9c *aged care building*, it connects, passes through or passes by not more than 2 consecutive *storeys* and one extra *storey* of any classification may be included if—

(A) the building has a sprinkler system complying with **Specification E1.5** installed throughout; or

(B) the *required exit* does not provide access to or egress for, and is separated from, the extra *storey* by construction having—

(aa) an FRL of –/60/60, if non-*loadbearing*; and

(bb) an FRL of 90/90/90 for Type A construction or 60/60/60 for Type B construction, if *loadbearing*; and

(cc) no opening that could permit the passage of fire or smoke.

D1.4 Exit travel distances

(a) **Class 2 and 3 buildings**—

(i) The entrance doorway of any *sole-occupancy unit* must be not more than—

(A) 6 m from an *exit* or from a point from which travel in different directions to 2 *exits* is available; or

(B) 20 m from a single *exit* serving the *storey* at the level of egress to a road or *open space*; and

(ii) no point on the floor of a room which is not in a *sole-occupancy unit* must be more than 20 m from an *exit* or from a point at which travel in different directions to 2 *exits* is available.

(b) **Class 4 parts** — The entrance doorway to any Class 4 part must be not more than 6 m from an *exit* or a point from which travel in different directions to 2 *exits* is available.

(c) **Class 5 to 9 buildings** — Subject to **(d)**, **(e)** and **(f)**—

(i) no point on a floor must be more than 20 m from an *exit*, or a point from which travel in different directions to 2 *exits* is available, in which case the maximum distance to one of those *exits* must not exceed 40 m; and

(ii) in a Class 5 or 6 building, the distance to a single *exit* serving a *storey* at the level of access to a road or *open space* may be increased to 30 m.

Vic D1.4(d)

(d) **Class 9a buildings** — In a *patient care area* in a Class 9a building—

(i) no point on the floor must be more than 12 m from a point from which travel in different directions to 2 of the *required exits* is available; and

(ii) the maximum distance to one of those *exits* must not be more than 30 m from the starting point.

(e) **Open spectator stands** — The distance of travel to an *exit* in a Class 9b building used as an *open spectator stand* must be not more than 60 m.

(f) **Assembly buildings** — In a Class 9b building other than a *school* or *early childhood centre*, the distance to one of the *exits* may be 60 m if—

(i) the path of travel from the room concerned to that *exit* is through another area which is a corridor, hallway, lobby, ramp or other circulation space; and

(ii) the room is smoke-separated from the circulation space by construction having an FRL of not less than 60/60/60 with every doorway in that construction protected by a tight fitting, *self-closing*, solid-core door not less than 35 mm thick; and

(iii) the maximum distance of travel does not exceed 40 m within the room and 20 m from the doorway to the room through the circulation space to the *exit*.

D1.5 Distance between alternative exits

Exits that are *required* as alternative means of egress must be—

(a) distributed as uniformly as practicable within or around the *storey* served and in positions where unobstructed access to at least 2 *exits* is readily available from all points on the floor including lift lobby areas; and

(b) not less than 9 m apart; and

(c) not more than—

(i) in a Class 2 or 3 building — 45 m apart; or

(ii) in a Class 9a *health-care building*, if such *required exit* serves a *patient care area* — 45 m apart; or

(iii) in all other cases — 60 m apart; and

(d) located so that alternative paths of travel do not converge such that they become less than 6 m apart.

D1.6 Dimensions of exits and paths of travel to exits

In a *required exit* or path of travel to an *exit*—

(a) the unobstructed height throughout must be not less than 2 m, except the unobstructed height of any doorway may be reduced to not less than 1980 mm; and

(b) the unobstructed width of each *exit* or path of travel to an *exit*, except for doorways, must be not less than—

(i) 1m; or

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(ii) 1.8 m in a passageway, corridor or ramp normally used for the transportation of patients in beds within a *treatment area* or *ward area*; and

(iii) in a *public corridor* in a Class 9c *aged care building*, notwithstanding **(c)** and **(d)**—

(A) 1.5 m; and

(B) 1.8 m for the full width of the doorway, providing access into a *sole-occupancy unit* or communal bathroom; and

(c) if the *storey* or *mezzanine* accommodates more than 100 persons but not more than 200 persons, the aggregate unobstructed width, except for doorways, must be not less than—

(i) 1 m plus 250 mm for each 25 persons (or part) in excess of 100; or

(ii) 1.8 m in a passageway, corridor or ramp normally used for the transportation of patients in beds within a *treatment area* or *ward area*; and

(d) if the *storey* or *mezzanine* accommodates more than 200 persons, the aggregate unobstructed width, except for doorways, must be increased to—

(i) 2 m plus 500 mm for every 60 persons (or part) in excess of 200 persons if egress involves a change in floor level by a stairway or ramp with a gradient steeper than 1 in 12; or

(ii) in any other case, 2 m plus 500 mm for every 75 persons (or part) in excess of 200; and

(e) in an *open spectator stand* which accommodates more than 2000 persons, the aggregate unobstructed width, except for doorways, must be increased to 17 m plus a width (in metres) equal to the number in excess of 2000 divided by 600; and

(f) the unobstructed width of a doorway must be not less than—

(i) in *patient care areas* through which patients would normally be transported in beds, if the doorway provides access to, or from, a corridor of width—

(A) less than 2.2 m — 1200 mm; or

(B) 2.2 m or greater — 1070 mm,

and where the doorway is fitted with two leaves and one leaf is secured in the closed position in accordance with **D2.21(a)(v)**, the other leaf must permit an unobstructed opening not less than 800 mm wide; or

(ii) in *patient care areas* in a *horizontal exit* — 1250 mm; or

(iii) the unobstructed width of each *exit* provided to comply with **(b)**, **(c)**, **(d)** or **(e)**, minus 250 mm; or

(iv) in a Class 9c *aged care building*—

Vic D1.6(f)(iv)

(A) 1070 mm where it opens from a *public corridor* to a *sole-occupancy unit*; or

(B) 870 mm in other *resident use areas*; or

(C) 800 mm in non-*resident use areas*,

and where the doorway is fitted with two leaves and one leaf is secured in the closed position in accordance with **D2.21(a)(v)**, the other leaf must permit an unobstructed opening not less than 870 mm wide in *resident use areas* and 800 mm wide in non-*resident use areas*; or

(v) in any other case except where it opens to a *sanitary compartment* or bathroom — 750 mm wide; and

NSW D1.6(f)(vi)

(g) the unobstructed width of a *required exit* must not diminish in the direction of travel to a road or *open space*, except where the width is increased in accordance with **(b)(ii)** or **(f)(i)**; and

(h) the *required* width of a stairway or ramp must—

(i) be measured clear of all obstructions such as handrails, projecting parts of balustrades or other barriers and the like; and

(ii) extend without interruption, except for ceiling cornices, to a height not less than 2 m vertically above a line along the nosings of the treads or the floor surface of the ramp or landing.

NSW D1.6(i)

D1.7 Travel via fire-isolated exits

(a) A doorway from a room must not open directly into a stairway, passageway or ramp that is *required* to be fire-isolated unless it is from—

(i) a *public corridor*, public lobby or the like; or

(ii) a *sole-occupancy unit* occupying all of a *storey*; or

(iii) a *sanitary compartment*, airlock or the like.

(b) Each *fire-isolated stairway* or *fire-isolated ramp* must provide independent egress from each *storey* served and discharge directly, or by way of its own *fire-isolated passageway*—

(i) to a road or *open space*; or

(ii) to a point—

(A) in a *storey* or space, within the confines of the building, that is used only for pedestrian movement, car parking or the like and is open for at least $^{2}/_{3}$ of its perimeter; and

(B) from which an unimpeded path of travel, not further than 20 m, is available to a road or *open space*; or

(iii) into a covered area that—

(A) adjoins a road or *open space*; and

(B) is open for at least 1/3 of its perimeter; and

(C) has an unobstructed clear height throughout, including the perimeter openings, of not less than 3 m; and

(D) provides an unimpeded path of travel from the point of discharge to the road or *open space* of not more than 6 m.

(c) Where a path of travel from the point of discharge of a fire-isolated *exit* necessitates passing within 6 m of any part of an *external wall* of the same building, measured horizontally at right angles to the path of travel, that part of the wall must have—

(i) an FRL of not less than 60/60/60; and

(ii) any openings protected internally in accordance with **C3.4**,

for a distance of 3 m above or below, as appropriate, the level of the path of travel, or for the height of the wall, whichever is the lesser.

(d) If more than 2 access doorways, not from a *sanitary compartment* or the like, open to a *required* fire-isolated *exit* in the same *storey*—

(i) a smoke lobby in accordance with **D2.6** must be provided; or

(ii) the *exit* must be pressurised in accordance with AS/NZS 1668.1.

(e) A ramp must be provided at any change in level less than 600 mm in a *fire-isolated passageway* in a Class 9 building.

D1.8 External stairways or ramps in lieu of fire-isolated exits

(a) An external stairway or ramp may serve as a *required exit* in lieu of a fire-isolated *exit* serving a *storey* below an *effective height* of 25 m, if the stairway or ramp is—

(i) *non-combustible* throughout; and

(ii) protected in accordance with **(c)** if it is within 6 m of, and exposed to any part of the *external wall* of the building it serves.

(b) For the purposes of this clause—

(i) exposure under **(a)(ii)**, is measured in accordance with **Clause 2.1 of Specification C1.1**, as if the *exit* was a building element and the *external wall* of the building was a *fire-source feature* to the *exit*, except that the FRL *required* in **Clause 2.1(a)(i)** must not be less than 60/60/60; and

(ii) the plane formed at the construction edge or perimeter of an unenclosed building or part such as an *open-deck carpark*, *open spectator stand* or the like, is deemed to be an *external wall*; and

(iii) openings in an *external wall* and openings under **(c)** and **(d)**, are determined in accordance with **C3.1**.

(c) The protection referred to in **(a)(ii)**, must adequately protect occupants using the *exit* from exposure to a fire within the building, in accordance with one of the following methods:

(i) The part of the *external wall* of the building to which the *exit* is exposed must have—

(A) an FRL of not less than 60/60/60; and

(B) no openings less than 3 m from the *exit* (except a doorway serving the *exit* protected by a –/60/30 fire door in accordance with **C3.8(a)**); and

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(C) any opening 3 m or more but less than 6 m from the *exit*, protected in accordance with **C3.4** and if wall wetting sprinklers are used, they are located internally.

(ii) The *exit* must be protected from—

(A) any part of the *external wall* of the building having an FRL of less than 60/60/60; and

(B) any openings in the *external wall*,

by the construction of a wall, roof, floor or other shielding element as appropriate in accordance with **(d)**.

(d) The wall, roof, floor or other shielding element *required* by **(c)(ii)** must—

(i) have an FRL of not less than 60/60/60; and

(ii) have no openings less than 3 m from the *external wall* of the building (except a doorway serving the *exit* protected by a –/60/30 fire door in accordance with **C3.8(a)**); and

(iii) have any opening 3 m or more but less than 6 m from any part of the *external wall* of the building protected in accordance with **C3.4** and if wall wetting sprinklers are used, they are located on the side exposed to the *external wall*.

D1.9 Travel by non-fire-isolated stairways or ramps

(a) A non-*fire-isolated stairway* or non-*fire-isolated ramp* serving as a *required exit* must provide a continuous means of travel by its own *flights* and landings from every *storey* served to the level at which egress to a road or *open space* is provided.

(b) In a Class 2, 3 or 4 building, the distance between the doorway of a room or *sole-occupancy unit* and the point of egress to a road or *open space* by way of a stairway or ramp that is not fire-isolated and is *required* to serve that room or *sole-occupancy unit* must not exceed—

(i) 30 m in a building of Type C construction; or

(ii) 60 m in all other cases.

(c) In a Class 5 to 9 building, the distance from any point on a floor to a point of egress to a road or *open space* by way of a *required* non-*fire-isolated stairway* or non-*fire-isolated ramp* must not exceed 80 m.

(d) In a Class 2, 3 or 9a building, a *required* non-*fire-isolated stairway* or non-*fire-isolated ramp* must discharge at a point not more than—

(i) 15 m from a doorway providing egress to a road or *open space* or from a *fire-isolated passageway* leading to a road or *open space*; or

(ii) 30 m from one of 2 such doorways or passageways if travel to each of them from the non-*fire-isolated stairway* or non-*fire-isolated ramp* is in opposite or approximately opposite directions.

(e) In a Class 5 to 8 or 9b building, a *required* non-*fire-isolated stairway* or non-*fire-isolated ramp* must discharge at a point not more than—

(i) 20 m from a doorway providing egress to a road or *open space* or from a *fire-isolated passageway* leading to a road or *open space*; or

(ii) 40 m from one of 2 such doorways or passageways if travel to each of them from the non-*fire-isolated stairway* or non-*fire-isolated ramp* is in opposite or approximately opposite directions.

(f) In a Class 2 or 3 building, if 2 or more *exits* are *required* and are provided by means of internal non-*fire-isolated stairways* or non-*fire-isolated ramps*, each *exit* must—

(i) provide separate egress to a road or *open space*; and

(ii) be suitably smoke-separated from each other at the level of discharge.

D1.10 Discharge from exits

(a) An *exit* must not be blocked at the point of discharge and where necessary, suitable barriers must be provided to prevent vehicles from blocking the *exit*, or access to it.

(b) If a *required exit* leads to an *open space*, the path of travel to the road must have an unobstructed width throughout of not less than—

(i) the minimum width of the *required exit*; or

(ii) 1 m,

whichever is the greater.

(c) If an *exit* discharges to *open space* that is at a different level than the public road to which it is connected, the path of travel to the road must be by—

(i) a ramp or other incline having a gradient not steeper than 1:8 at any part, or not steeper than 1:14 if *required* by the *Deemed-to-Satisfy Provisions* of **Part D3**; or

(ii) except if the *exit* is from a Class 9a building, a stairway complying with the *Deemed-to-Satisfy Provisions* of the BCA.

(d) The discharge point of alternative *exits* must be located as far apart as practical.

(e) In a Class 9b building which is an *open spectator stand* that accommodates more than 500 persons, a *required* stairway or *required* ramp must not discharge to the ground in front of the stand.

NSW D1.10(f)

(f) In a Class 9b building containing an auditorium which accommodates more than 500 persons, not more than $^2/_3$ of the *required* width of *exits* must be located in the main entrance foyer.

D1.11 Horizontal exits

(a) *Horizontal exits* must not be counted as *required exits*—

(i) between *sole-occupancy units*; or

(ii) in a Class 9b building used as an *early childhood centre*, primary or secondary *school*.

(b) In a Class 9a *health-care building* or Class 9c *aged care building*, *horizontal exits* may be counted as *required exits* if the path of travel from a *fire compartment* leads by one or more *horizontal exits* directly into another *fire compartment* which has at least one *required exit* which is not a *horizontal exit*.

(c) In cases other than in **(b)**, *horizontal exits* must not comprise more than half of the *required exits* from any part of a *storey* divided by a *fire wall*.

(d) *Horizontal exits* must have a clear area on the side of the *fire wall* to which occupants are evacuating, to accommodate the total number of persons (calculated under **D1.13**) served by the *horizontal exit* of not less than—

(i) 2.5 m^2 per patient/resident in a Class 9a *health-care building* or Class 9c *aged care building*; and

(ii) 0.5 m^2 per person in any other case.

(e) Where a *fire compartment* is provided with only two *exits*, and one of those *exits* is a *horizontal exit*, the clear area *required* by **(d)** is to be of a size that accommodates all the occupants from the *fire compartment* being evacuated.

(f) The clear area *required* by **(d)** must be connected to the *horizontal exit* by an unobstructed path that has at least the dimensions *required* for the *horizontal exit* and may include the area of the unobstructed path.

D1.12 Non-required stairways, ramps or escalators

An escalator, moving walkway or non-*required* non *fire-isolated stairway* or pedestrian ramp—

(a) must not be used between *storeys* in—

(i) a *patient care area* in a Class 9a *health-care building*; or

(ii) a *resident use area* in a Class 9c *aged care building*, and

(b) may connect any number of *storeys* if it is—

(i) in an *open spectator stand* or indoor sports stadium; or

(ii) in a *carpark* or an *atrium*; or

(iii) outside a building; or

(iv) in a Class 5 or 6 building that is sprinklered throughout, where the escalator, walkway, stairway or ramp complies with **Specification D1.12**; and

(c) except where permitted in **(b)** must not connect more than—

(i) 3 *storeys* if each of those *storeys* is provided with a sprinkler system complying with **Specification E1.5** throughout; or

(ii) 2 *storeys*,

provided that in each case, those *storeys* must be consecutive, and one of those *storeys* is situated at a level at which there is direct egress to a road or *open space*; and

(d) except where permitted in **(b)** or **(c)**, must not connect, directly or indirectly, more than 2 *storeys* at any level in a Class 5, 6, 7, 8 or 9 building and those *storeys* must be consecutive.

D1.13 Number of persons accommodated

The number of persons accommodated in a *storey*, room or *mezzanine* must be determined with consideration to the purpose for which it is used and the layout of the *floor area* by—

(a) calculating the sum of the numbers obtained by dividing the *floor area* of each part of the *storey* by the number of square metres per person listed in **Table D1.13** according to the use of that part, excluding spaces set aside for—

(i) lifts, stairways, ramps and escalators, corridors, hallways, lobbies and the like; and

(ii) service ducts and the like, *sanitary compartments* or other ancillary uses; or

(b) reference to the seating capacity in an *assembly building* or room; or

(c) any other suitable means of assessing its capacity.

NSW Table D1.13

Table D1.13 AREA PER PERSON ACCORDING TO USE

Type of use		m^2 per person
Art gallery, exhibition area, museum		4
Bar	—bar standing	0.5
	—other	1
Board room		2
Boarding house		15
Cafe, church, dining room		1
Carpark		30
Computer room		25
Court room	—judicial area	10
	—public seating	1
Dance floor		0.5
Dormitory		5
Early childhood centre		4

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Table D1.13 AREA PER PERSON ACCORDING TO USE (Continued)

Type of use			m^2 per person
Factory—	(a)	machine shop, fitting shop or like place for cutting, for cutting, grading, finishing or fitting of metals or glass, except in the fabrication of structural steelwork or manufacture of vehicles or bulky products	5
	(b)	areas used for fabrication and processing other than those in (a)	50
	(c)	a space in which the layout and natural use of fixed plant or equipment determines the number of persons who will occupy the space during working hours	Area per person determined by the use of the plant or equipment
Gymnasium			3
Hostel, hotel, motel, guest house			15
Indoor sports stadium—arena			10
Kiosk			1
Kitchen, laboratory, laundry			10
Library	—reading space		2
	—storage space		30
Office, including one for typewriting or document copying			10
Patient care areas			10
Plant room	—ventilation, electrical or other service units		30
	—boilers or power plant		50
Reading room			2
Restaurant			1
School	—general classroom		2
	—multi-purpose hall		1
	—staff room		10
	—trade and practical area	—primary	4
		—secondary	As for workshop
Shop	—space for sale of goods—		

Table D1.13 AREA PER PERSON ACCORDING TO USE (Continued)

Type of use		m^2 per person
	(a) at a level entered direct from the open air or any lower level	3
	(b) all other levels	5
Showroom	—display area, covered mall or arcade	5
Skating rink, based on rink area		1.5
Spectator stand, audience viewing area		
	—standing viewing area	0.3
	—removable seating	1
	—fixed seating (number of seats)	
	—bench seating (450 mm/person)	
Storage space		30
Swimming pool, based on pool area		1.5
Switch room, transformer room		30
Telephone exchange		30
	—private	
Theatre and public hall		1
Theatre dressing room		4
Transport terminal		2
Workshop	—for maintenance staff	30
	—for manufacturing processes	As for Factory

Notes to table:

Bar standing is the area used by standing patrons and extends not less than 1.5m wide from the outside edge of the bar top for the length of the serving area of the bar.

D1.14 Measurement of distances

The nearest part of an *exit* means in the case of—

(a) a *fire-isolated stairway*, *fire-isolated passageway*, or *fire-isolated ramp*, the nearest part of the doorway providing access to them; and

(b) a non-*fire-isolated stairway*, the nearest part of the nearest riser; and

(c) a non-*fire-isolated ramp*, the nearest part of the junction of the floor of the ramp and the floor of the *storey*; and

(d) a doorway opening to a road or *open space*, the nearest part of the doorway; and

(e) a *horizontal exit*, the nearest part of the doorway.

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D1.15 Method of measurement

The following rules apply:

(a) In the case of a room that is not a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part, the distance includes the straight-line measurement from any point on the floor of the room to the nearest part of a doorway leading from it, together with the distance from that part of the doorway to the single *required exit* or point from which travel in different directions to 2 *required exits* is available.

(b) Subject to **(d)**, the distance from the doorway of a *sole-occupancy unit* in a Class 2 or 3 building or a Class 4 part is measured in a straight line to the nearest part of the *required* single *exit* or point from which travel in different directions to 2 *required exits* is available.

(c) Subject to **(d)**, the distance between *exits* is measured in a straight line between the nearest parts of those *exits*.

(d) Only the shortest distance is taken along a corridor, hallway, external balcony or other path of travel that curves or changes direction.

(e) If more than one corridor, hallway, or other internal path of travel connects *required exits*, the measurement is along the path of travel through the point at which travel in different directions to those *exits* is available.

(f) If a wall (including a demountable *internal wall*) that does not bound—

(i) a room; or

(ii) a corridor, hallway or the like,

causes a change of direction in proceeding to a *required exit*, the distance is measured along the path of travel past that wall.

(g) If permanent fixed seating is provided, the distance is measured along the path of travel between the rows of seats.

(h) In the case of a non-*fire-isolated stairway* or non-*fire-isolated ramp*, the distance is measured along a line connecting the nosings of the treads, or along the slope of the ramp, together with the distance connecting those lines across any intermediate landings.

D1.16 Plant rooms, lift machine rooms and electricity network substations: Concession

(a) A ladder may be used in lieu of a stairway to provide egress from—

(i) a plant room with a *floor area* of not more than 100 m^2; or

(ii) all but one point of egress from a plant room, a lift machine room or a Class 8 *electricity network substation* with a *floor area* of not more than 200 m^2.

(b) A ladder permitted under **(a)**—

(i) may form part of an *exit* provided that in the case of a *fire-isolated stairway* it is contained within the *shaft*; or

(ii) may discharge within a *storey* in which case it must be considered as forming part of the path of travel; and

(iii) must comply with—

(A) AS 1657 for a plant room or a Class 8 *electricity network substation*; and

(B) AS 1735.2 for a lift machine room.

D1.17 Access to lift pits

Access to lift pits must—

(a) where the pit depth is not more than 3 m, be through the lowest landing doors; or

(b) where the pit depth is more than 3 m, be provided through an access doorway complying with the following:

(i) In lieu of **D1.6**, the doorway must be level with the pit floor and not be less than 600 mm wide by 1980 mm high clear opening, which may be reduced to 1500 mm where it is necessary to comply with **(ii)**.

(ii) No part of the lift car or platform must encroach on the pit doorway entrance when the car is on a fully compressed buffer.

(iii) Access to the doorway must be by a stairway complying with AS 1657.

(iv) In lieu of **D2.21**, doors fitted to the doorway must be—

(A) of the horizontal sliding or outwards opening hinged type; and

(B) self-closing and self-locking from the outside; and

(C) marked on the landing side with the letters not less than 35 mm high:

"DANGER LIFTWELL – ENTRY OF UNAUTHORIZED PERSONS PROHIBITED – KEEP CLEAR AT ALL TIMES"

ACT D1.101

PART D2 CONSTRUCTION OF EXITS

Deemed-to-Satisfy Provisions

D2.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **DP1** to **DP9** are satisfied by complying with—

(i) **D1.1** to **D1.16**, **D2.1** to **D2.23** and **D3.1** to **D3.12**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**; and

(iv) for public transport buildings, **Part H2**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **D1.1** to **D1.16**, **D2.1** to **D2.23** and **D3.1** to **D3.12**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**; and

(iv) for public transport buildings, **Part H2**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

D2.1 Application of Part

Except for—

(a) **D2.13**, **D2.14(a)**, **D2.16**, **D2.17(d)**, **D2.17(e)** and **D2.21**, the *Deemed-to-Satisfy Provisions* of this Part do not apply to the internal parts of a *sole-occupancy unit* in a Class 3 building; and

(b) **D2.13**, **D2.14(a)**, **D2.16**, **D2.17(d)**, **D2.17(e)** and **D2.18**, the *Deemed-to-Satisfy Provisions* of this Part do not apply to the internal parts of a *sole-occupancy unit* in a Class 2 building or Class 4 part.

NSW D2.1(c)

D2.2 Fire-isolated stairways and ramps

A stairway or ramp (including any landings) that is *required* to be within a *fire-resisting shaft* must be constructed—

(a) of *non-combustible* materials; and

(b) so that if there is local failure it will not cause structural damage to, or impair the fire-resistance of, the *shaft*.

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D2.3 Non-fire-isolated stairways and ramps

In a building having a *rise in storeys* of more than 2, *required* stairs and ramps (including landings and any supporting building elements) which are not *required* to be within a *fire-resisting shaft*, must be constructed according to **D2.2**, or only of—

(a) reinforced or prestressed concrete; or

(b) steel in no part less than 6 mm thick; or

(c) timber that—

(i) has a finished thickness of not less than 44 mm; and

(ii) has an average density of not less than 800 kg/m^3 at a moisture content of 12%; and

(iii) has not been joined by means of glue unless it has been laminated and glued with resorcinol formaldehyde or resorcinol phenol formaldehyde glue.

D2.4 Separation of rising and descending stair flights

If a stairway serving as an *exit* is *required* to be fire-isolated—

(a) there must be no direct connection between—

(i) a *flight* rising from a *storey* below the lowest level of access to a road or *open space*; and

(ii) a *flight* descending from a *storey* above that level; and

(b) any construction that separates or is common to the rising and descending *flights* must be—

(i) *non-combustible*; and

(ii) smoke proof in accordance with **Clause 2 of Specification C2.5**.

D2.5 Open access ramps and balconies

Where an open access ramp or balcony is provided to meet the smoke hazard management requirements of **Table E2.2a**, it must—

(a) have ventilation openings to the outside air which—

(i) have a total unobstructed area not less than the *floor area* of the ramp or balcony; and

(ii) are evenly distributed along the open sides of the ramp or balcony; and

(b) not be enclosed on its open sides above a height of 1 m except by an open grille or the like having a free air space of not less than 75% of its area.

D2.6 Smoke lobbies

A smoke lobby *required* by **D1.7** must—

(a) have a *floor area* not less than 6 m^2; and

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(b) be separated from the occupied areas in the *storey* by walls which are impervious to smoke, and—

(i) have an FRL of not less than 60/60/– (which may be fire-protective grade plasterboard, gypsum block with set plaster, face brickwork, glass blocks or glazing); and

(ii) extend from slab to slab, or to the underside of a ceiling with a *resistance to the incipient spread of fire* of 60 minutes which covers the lobby; and

(iii) any construction joints between the top of the walls and the floor slab, roof or ceiling must be smoke sealed with intumescent putty or other suitable material; and

(c) at any opening from the occupied areas, have smoke doors complying with **Clause 3 of Specification C3.4** except that the smoke sensing device need only be located on the approach side of the opening; and

(d) be pressurised as part of the *exit* if the *exit* is *required* to be pressurised under **E2.2**.

D2.7 Installations in exits and paths of travel

(a) Access to service *shafts* and services other than to fire-fighting or detection equipment as permitted in the *Deemed-to-Satisfy Provisions* of **Section E**, must not be provided from a *fire-isolated stairway*, *fire-isolated passageway* or *fire-isolated ramp*.

(b) An opening to any chute or duct intended to convey hot products of combustion from a boiler, incinerator, fireplace or the like, must not be located in any part of a *required exit* or any corridor, hallway, lobby or the like leading to a *required exit*.

(c) Gas or other fuel services must not be installed in a *required exit*.

(d) Services or equipment comprising—

(i) electricity meters, distribution boards or ducts; or

(ii) central telecommunications distribution boards or equipment; or

(iii) electrical motors or other motors serving equipment in the building,

may be installed in—

(iv) a *required exit*, except for fire-isolated *exits* specified in **(a)**; or

(v) in any corridor, hallway, lobby or the like leading to a *required exit*,

if the services or equipment are enclosed by *non-combustible* construction or a *fire-protective covering* with doorways or openings suitably sealed against smoke spreading from the enclosure.

(e) Electrical wiring may be installed in a fire-isolated *exit* if the wiring is associated with—

(i) a lighting, detection, or pressurisation system serving the *exit*; or

(ii) a security, surveillance or management system serving the *exit*; or

(iii) an intercommunication system or an audible or visual alarm system in accordance with **D2.22**; or

(iv) the monitoring of hydrant or sprinkler isolating valves.

D2.8 Enclosure of space under stairs and ramps

(a) **Fire-isolated stairways and ramps** — If the space below a *required fire-isolated stairway* or *fire-isolated ramp* is within the fire-isolated *shaft*, it must not be enclosed to form a cupboard or similar enclosed space.

(b) **Non fire-isolated stairways and ramps** — The space below a *required* non *fire-isolated stairway* (including an external stairway) or non *fire-isolated ramp* must not be enclosed to form a cupboard or other enclosed space unless—

(i) the enclosing walls and ceilings have an FRL of not less than 60/60/60; and

(ii) any access doorway to the enclosed space is fitted with a *self-closing* –/60/30 fire door.

D2.9 Width of required stairways and ramps

A *required* stairway or ramp that exceeds 2 m in width is counted as having a width of only 2 m unless it is divided by a handrail, balustrade or other barrier continuous between landings and each division has a width of not more than 2 m.

D2.10 Pedestrian ramps

(a) A *fire-isolated ramp* may be substituted for a *fire-isolated stairway* if the construction enclosing the *ramp* and the width and ceiling height comply with the requirements for a *fire-isolated stairway*.

(b) A ramp serving as a *required exit* must—

(i) where the ramp is also serving as an *accessible* ramp under **Part D3**, be in accordance with AS 1428.1; or

(ii) in any other case, have a gradient not steeper than 1:8.

(c) The floor surface of a ramp must have a non-slip finish.

D2.11 Fire-isolated passageways

(a) The enclosing construction of a *fire-isolated passageway* must have an FRL when tested for a fire outside the passageway in another part of the building of—

(i) if the passageway discharges from a *fire-isolated stairway* or *ramp* — not less than that *required* for the stairway or ramp *shaft*; or

(ii) in any other case — not less than 60/60/60.

(b) Notwithstanding **(a)(ii)**, the top construction of a *fire-isolated passageway* need not have an FRL if the walls of the *fire-isolated passageway* extend to the underside of—

(i) a *non-combustible* roof covering; or

(ii) a ceiling having a *resistance to the incipient spread of fire* of not less than 60 minutes separating the roof space or ceiling space in all areas surrounding the passageway within the *fire compartment*.

D2.12 Roof as open space

If an *exit* discharges to a roof of a building, the roof must—

(a) have an FRL of not less than 120/120/120; and

(b) not have any rooflights or other openings within 3 m of the path of travel of persons using the *exit* to reach a road or *open space*.

D2.13 Goings and risers

(a) A stairway must have—

(i) not more than 18 nor less than 2 risers in each *flight*; and

(ii) except as permitted by **(b)** and **(c)**, going (G), riser (R) and quantity (2R + G) in accordance with **Table D2.13**; and

(iii) except as permitted by **(b)** and **(c)**, goings and risers that are constant throughout in one *flight*; and

(iv) risers which do not have any openings that would allow a 125 mm sphere to pass through between the treads; and

(v) treads which have a non-slip finish or an adequate non-skid strip near the edge of the nosings; and

(vi) treads of solid construction (not mesh or other perforated material) if the stairway is more than 10 m high or connects more than 3 *storeys*; and

(vii) in a Class 9b building, not more than 36 risers in consecutive *flights* without a change in direction of at least 30°; and

(viii) in the case of a *required* stairway, no winders in lieu of a landing.

NSW D2.13(a)(ix),(x),(xi)

(b) In the case of a non-*required* stairway—

(i) the stairway must have—

(A) not more than 3 winders in lieu of a quarter landing; and

(B) not more than 6 winders in lieu of a half landing; and

(ii) the going of all straight treads must be constant throughout the same *flight*; and

(iii) the going of all winders in lieu of a quarter or half landing may vary from the going of the straight treads within the same *flight* provided that the going of all such winders is constant.

(c) Where a stairway discharges to a sloping public walkway or public road—

(i) the riser (R) may be reduced to account for the slope of the walkway or road; and

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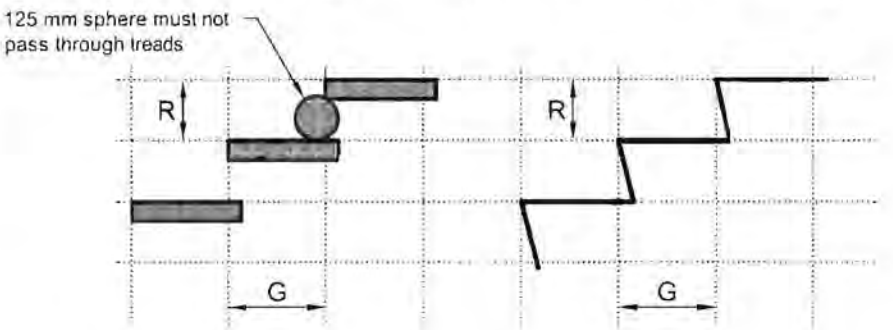
(ii) the quantity (2R+G) may vary at that location.

Table D2.13 RISER AND GOING DIMENSIONS (mm)

	Riser (R)		Going (G)[b]		Quantity (2R+G)	
	Max	Min	Max	Min	Max	Min
Public stairways	190	115	355	250	700	550
Private stairways[a]	190	115	355	240	700	550



Note:

(a) Private stairways are—

(i) stairways in a *sole-occupancy unit* in a Class 2 building or Class 4 part; and

(ii) in any building, stairways which are not part of a *required exit* and to which the public do not normally have access.

(b) The going in tapered treads (except winders in lieu of a quarter or half landing) in a curved or spiral stairway is measured—

(i) 270 mm in from the outer side of the unobstructed width of the stairway if the stairway is less than 1 m wide (applicable to a non-*required* stairway only); and

(ii) 270 mm from each side of the unobstructed width of the stairway if the stairway is 1 m wide or more.

D2.14 Landings

In a stairway—

(a) landings having a maximum gradient of 1:50 may be used in any building to limit the number of risers in each *flight* and each landing must—

(i) be not less than 750 mm long, and where this involves a change in direction, the length is measured 500 mm from the inside edge of the landing; and

(ii) have a non-slip finish throughout or an adequate non-skid strip near the edge of the landing where it leads to a *flight* below; and

(b) in a Class 9a building—

(i) the area of any landing must be sufficient to move a stretcher, 2 m long and 600 mm wide, at a gradient not more than the gradient of the stairs, with at least one end of the stretcher on the landing while changing direction between *flights*; or

(ii) the stair must have a change of direction of 180°, and the landing a clear width of not less than 1.6 m and a clear length of not less than 2.7 m.

D2.15 Thresholds

The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless—

(a) in *patient care areas* in a Class 9a *health-care building*, the door sill is not more than 25 mm above the finished floor level to which the doorway opens; or

(b) in a Class 9c *aged care building*, a ramp is provided with a maximum gradient of 1:8 for a maximum height of 25 mm over the threshold; or

NSW D2.15(c),(d)

(c) In other cases—

(i) the doorway opens to a road or *open space*, external stair landing or external balcony; and

(ii) the door sill is not more than 190 mm above the finished surface of the ground, balcony, or the like, to which the doorway opens.

D2.16 Balustrades or other barriers

(a) A continuous balustrade or other barrier must be provided along the side of any roof to which public access is provided, any stairway or ramp, any floor, corridor, hallway, balcony, deck, verandah, *mezzanine*, access bridge or the like and along the side of any delineated path of access to a building, if—

(i) it is not bounded by a wall; and

(ii) its level above the surface beneath, is more than—

(A) 4 m where it is possible for a person to fall through an openable *window*; or

(B) 1 m in any other case.

(b) The requirements of **(a)** do not apply to—

(i) the perimeter of a *stage*, rigging loft, loading dock or the like; or

(ii) areas referred to in **D2.18**; or

(iii) a retaining wall unless the retaining wall forms part of, or is directly associated with a delineated path of access to a building from the road, or a delineated path of access between buildings.

(c) A balustrade or other barrier in—

(i) *fire-isolated stairways*, *fire-isolated ramps* and other areas used primarily for emergency purposes, excluding external stairways and external ramps; and

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(ii) Class 7 (other than *carparks*) and Class 8 buildings and parts of buildings containing those classes,

must comply with **(g)** and **(h)(i)**.

(d) A balustrade or other barrier in stairways and ramps, other than those covered in **(c)**, must comply with **(g)** and **(h)(ii)**.

(e) A balustrade or other barrier along the side of a horizontal or near horizontal surface such as a—

(i) roof to which public access is provided and any path of access to a building; and

(ii) floor, corridor, hallway, balcony, verandah, *mezzanine*, access bridge or the like,

must comply with **(g)** and **(h)(ii)**.

(f) A balustrade or other barrier in front of fixed seating on a *mezzanine* or balcony within an auditorium in a Class 9b building must comply with **(g)(iv)** and **(h)(ii)**.

(g) The height of a balustrade or other barrier must be constructed in accordance with the following:

(i) The height is not less than 865 mm above the nosings of the stair treads or the floor of a ramp or other path of travel with a gradient not less than 1:20.

(ii) The height is not less than—

(A) 1 m above the floor of any access path, balcony, landing or the like where the path of travel has a gradient less than 1:20; or

(B) 865 mm above the floor of a landing to a stair or ramp where the balustrade or other barrier is provided along the inside edge of the landing and does not exceed a length of 500 mm; or

(C) 865 mm above the floor beneath an openable *window*.

(iii) A transition zone may be incorporated where the balustrade or other barrier height changes from 865 mm on the stair *flight* or ramp to 1 m at the landing.

NSW D2.16(g)(iv) and (v)

(iv) For a balustrade or other barrier provided under **(f)**, the height above the floor must be not less than—

(A) 1 m; or

(B) 700 mm and a horizontal projection extends not less than 1 m outwards from the top of the balustrade.

(h) Openings in a balustrade or other barrier must be constructed in accordance with the following:

(i) For a balustrade or other barrier provided under **(c)**—

(A) the balustrade openings or the width of any other opening (including any openable *window* or panel) must not be more than 300 mm; or

(B) where rails are used, a rail must be provided which does not permit a 150 mm sphere to pass through the opening between the nosing line

of the stair treads and the rail or between the rail and the floor of the landing, balcony or the like and the opening between rails must not be more than 460 mm.

(ii) For a balustrade or other barrier other than those provided under **(c)**—

(A) any opening does not permit a 125 mm sphere to pass through it and for stairs, the opening is measured above the nosing line of the stair treads; and

(B) for floors more than 4 m above the surface beneath, any horizontal or near horizontal elements between 150 mm and 760 mm above the floor must not facilitate climbing.

(i) A wire balustrade must be constructed in accordance with the following and is deemed to meet the requirements of **(h)(ii)(A)**:

(i) For horizontal wire systems—

(A) when measured with a strain indicator, it must be in accordance with the tension values in **Table D2.16a**; or

(B) must not exceed the maximum deflections in **Table D2.16c**.

(ii) For non-continuous vertical wire systems, when measured with a strain indicator, must be in accordance with the tension values in **Table D2.16a** (see Note 4).

(iii) For continuous vertical or continuous near vertical sloped wire systems—

(A) must have wires of no more than 2.5 mm diameter with a lay of 7×7 or 7×19 construction; and

(B) changes in direction at support rails must pass around a pulley block without causing permanent deformation to the wire; and

(C) must have supporting rails, constructed with a spacing of not more than 900 mm, of a material that does not allow deflection that would decrease the tension of the wire under load; and

(D) when the wire tension is measured with a strain indicator, it must be in accordance with the tension values in **Table D2.16b** and measured in the furthermost span from the tensioning device.

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TABLE D2.16a WIRE BALUSTRADE CONSTRUCTION – REQUIRED TENSION FOR STAINLESS STEEL HORIZONTAL WIRES

			Clear distance between posts (mm)								
			600	800	900	1000	1200	1500	1800	2000	2500
Wire dia. (mm)	Lay	Wire spacing (mm)	Minimum *required* tension in Newtons (N)								
2.5	7x7	60	55	190	263	415	478	823	1080	1139	X
		80	382	630	730	824	1025	1288	X	X	X
		100	869	1218	1368	X	X	X	X	X	X
2.5	1x19	60	35	218	310	402	585	810	1125	1325	X
		80	420	630	735	840	1050	1400	1750	X	X
		100	1140	1565	X	X	X	X	X	X	X
3.0	7x7	60	15	178	270	314	506	660	965	1168	1491
		80	250	413	500	741	818	1083	1370	1565	X
		100	865	1278	1390	1639	X	X	X	X	X
3.0	1x19	60	25	183	261	340	520	790	1025	1180	X
		80	325	555	670	785	1015	1330	1725	1980	X
		100	1090	1500	1705	1910	X	X	X	X	X
4.0	7x7	60	5	73	97	122	235	440	664	813	1178
		80	196	422	480	524	760	1100	1358	1530	2130
		100	835	1182	1360	1528	1837	2381	2811	3098	X
4.0	1x19	60	5	5	10	15	20	147	593	890	1280
		80	30	192	300	415	593	1105	1303	1435	1844
		100	853	1308	1487	1610	2048	2608	3094	3418	3849
4.0	7x19	60	155	290	358	425	599	860	1080	1285	1540
		80	394	654	785	915	1143	1485	1860	2105	2615
		100	1038	1412	1598	1785	2165	2735	X	X	X

Notes:

1. Lay = number of strands by the number of individual wires in each strand. For example a lay of 7x19 consists of 7 strands with 19 individual wires in each strand.
2. Where a change of direction is made in a run of wire, the tensioning device is to be placed at the end of the longest span.
3. If a 3.2 mm wire is used the tension figures for 3.0 mm wire are applied.

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TABLE D2.16a WIRE BALUSTRADE CONSTRUCTION – REQUIRED TENSION FOR STAINLESS STEEL HORIZONTAL WIRES (Continued)

4. This table may also be used for a set of non-continuous (single) vertical wires forming a balustrade using the appropriate clear distance between posts as the vertical clear distance between the rails.
5. X = Not allowed because the required tension would exceed the safe load of the wire.
6. Tension measured with a strain indicator.

TABLE D2.16b CONTINUOUS WIRE BALUSTRADE CONSTRUCTION – REQUIRED TENSION FOR VERTICAL OR NEAR VERTICAL STAINLESS STEEL WIRES

Wire dia. (mm)	Lay	Widest spacing between wires (mm)	Maximum clear spacing between rails (mm)
			900
			***Required* tension in Newtons (N)**
2.5	**7x19**	**80**	145
		100	310
		110	610
2.5	**7x7**	**80**	130
		100	280
		110	500

Notes:

1. Lay = number of strands by the number of individual wires in each strand. For example a lay of 7x19 consists of 7 strands with 19 individual wires in each strand.
2. Vertical wires require two pulley blocks to each 180^0 change of direction in the wire.
3. Near vertical wires may only require one pulley block for each change of direction.
4. Tension measured with a strain indicator.
5. The table only includes 7x7 and 7x19 wires due to other wires not having sufficient flexibility to make the necessary turns.

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TABLE D2.16c WIRE BALUSTRADE CONSTRUCTION – MAXIMUM PERMISSIBLE DEFLECTION FOR STAINLESS STEEL WIRES

		Clear distance between posts (mm)					
		600	900	1200	1500	1800	2000
Wire dia. (mm)	Wire spacing (mm)	Maximum permissible deflection of each wire in mm when a 2 kg mass is suspended at mid span					
2.5	60	17	11	9	8	8	8
	80	7	5	5	5	X	X
3.0	60	19	13	8	7	7	7
	80	8	6	6	5	5	5
4.0	60	18	12	8	8	7	7
	80	8	6	4	4	4	4

Notes:

1. Where a change of direction is made in a run of wire the 2 kg mass must be placed at the middle of the longest span.
2. If a 3.2 mm wire is used the deflection figures for 3.0 mm wire are applied.
3. This table may also be used for a set of non-continuous (single) vertical wires forming a balustrade using the appropriate clear distance between posts as the vertical clear distance between the rails. The deflection (offset) is measured by hooking a standard spring scale to the mid span of each wire and pulling it horizontally until a force of 19.6 N is applied.
4. X = Not allowed because the required tension would exceed the safe load of the wire.
5. This table has been limited to 60 mm and 80 mm spaces for 2.5 mm, 3 mm and 4 mm diameter wires because the required wire tensions at greater spacings would require the tension to be beyond the wire safe load limit, or the allowed deflection would be impractical to measure.

D2.17 Handrails

(a) Except for handrails referred to in **D2.18**, handrails must be—

(i) located along at least one side of the ramp or *flight*; and

(ii) located along each side if the total width of the stairway or ramp is 2 m or more; and

(iii) in a Class 9b building used as a primary *school*—

(A) have one handrail fixed at a height of not less than 865 mm; and

(B) have a second handrail fixed at a height between 665 mm and 750 mm,

measured above the nosings of stair treads and the floor surface of the ramp, landing or the like; and

(iv) in any other case, fixed at a height of not less than 865 mm measured above the nosings of stair treads and the floor surface of the ramp, landing, or the like; and

(v) continuous between stair *flight* landings and have no obstruction on or above them that will tend to break a hand-hold.

(b) Handrails—

(i) in a Class 9a *health-care building* must be provided along at least one side of every passageway or corridor used by patients, and must be—

(A) fixed not less than 50 mm clear of the wall; and

(B) where practicable, continuous for their full length.

(ii) in a Class 9c *aged care building* must be provided along both sides of every passageway or corridor used by residents, and must be—

(A) fixed not less than 50 mm clear of the wall; and

(B) where practicable, continuous for their full length.

(c) Handrails *required* to assist people with a disability must be provided in accordance with **D3.3**.

(d) Handrails to a stairway or ramp within a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part must—

(i) be located along at least one side of the *flight* or ramp; and

(ii) be located along the full length of the *flight* or ramp, except in the case where a handrail is associated with a balustrade, the handrail may terminate where the balustrade terminates; and

(iii) have the top surface of the handrail not less than 865 mm vertically above the nosings of the stair treads or the floor surface of the ramp; and

(iv) have no obstruction on or above them that will tend to break a handhold, except for newel posts, ball type stanchions, or the like.

(e) The requirements of **(d)** do not apply to—

(i) handrails referred to in **D2.18**; or

(ii) a stairway or ramp providing a change in elevation of less than 1 m; or

(iii) a landing; or

(iv) a winder where a newel post is installed to provide a handhold.

D2.18 Fixed platforms, walkways, stairways and ladders

A fixed platform, walkway, stairway, ladder and any going and riser, landing, handrail, balustrade or other barrier attached thereto may comply with AS 1657 in lieu of **D2.13**, **D2.14**, **D2.16** and **D2.17** if it only serves:

(a) machinery rooms, boiler houses, lift-machine rooms, plant-rooms, and the like; or

(b) non-*habitable rooms*, such as attics, storerooms and the like that are not used on a frequent or daily basis in the internal parts of a *sole-occupancy unit* in a Class 2 building or Class 4 part.

D2.19 Doorways and doors

(a) A doorway in a *resident use area* of a Class 9c *aged care building* must not be fitted with—

(i) a sliding fire door; or

(ii) a sliding smoke door; or

(iii) a revolving door; or

(iv) a roller shutter door; or

(v) a tilt-up door.

(b) A doorway serving as a *required exit* or forming part of a *required exit*, or a doorway in a *patient care area* of a Class 9a *health-care building*—

(i) must not be fitted with a revolving door; and

(ii) must not be fitted with a roller shutter or tilt-up door unless—

(A) it serves a Class 6, 7 or 8 building or part with a *floor area* not more than 200 m^2; and

(B) the doorway is the only *required exit* from the building or part; and

(C) it is held in the open position while the building or part is lawfully occupied; and

(iii) must not be fitted with a sliding door unless—

(A) it leads directly to a road or *open space*; and

(B) the door is able to be opened manually under a force of not more than 110 N; and

(iv) if fitted with a door which is power-operated—

(A) it must be able to be opened manually under a force of not more than 110 N if there is a malfunction or failure of the power source; and

(B) if it leads directly to a road or *open space* it must open automatically if there is a power failure to the door or on the activation of a fire or smoke alarm anywhere in the *fire compartment* served by the door.

NSW D2.19(b)(v)

(c) A power-operated door in a path of travel to a *required exit*, except for a door in a *patient care area* of a Class 9a *health-care building* as provided in **(b)**, must be able to be opened manually under a force of not more than 110 N if there is a malfunction or failure of the power source.

D2.20 Swinging doors

A swinging door in a *required exit* or forming part of a *required exit*—

(a) must not encroach—

(i) at any part of its swing by more than 500 mm on the *required* width (including any landings) of a *required*—

(A) stairway; or

(B) ramp; or

(C) passageway,

if it is likely to impede the path of travel of the people already using the *exit*; and

(ii) when fully open, by more than 100 mm on the *required* width of the *required exit*, and

the measurement of encroachment in each case is to include door handles or other furniture or attachments to the door; and

(b) must swing in the direction of egress unless—

(i) it serves a building or part with a *floor area* not more than 200 m^2, it is the only *required exit* from the building or part and it is fitted with a device for holding it in the open position; or

(ii) it serves a *sanitary compartment* or airlock (in which case it may swing in either direction); and

(c) must not otherwise impede the path or direction of egress.

D2.21 Operation of latch

(a) Except as *required* by **(b)**, a door in a *required exit*, forming part of a *required exit* or in the path of travel to a *required exit* must be readily openable without a key from the side that faces a person seeking egress, by a single hand downward action or pushing action on a single device which is located between 900 mm and 1.1 m from the floor, except if it—

(i) serves a vault, strong-room, *sanitary compartment*, or the like; or

(ii) serves only, or is within—

(A) a *sole-occupancy unit* in a Class 2 building or a Class 4 part; or

(B) a *sole-occupancy unit* in a Class 3 building (other than an entry door to a *sole-occupancy unit* of a boarding house, guest house, hostel, lodging house or backpacker accommodation); or

(C) a *sole-occupancy unit* with a *floor area* not more than 200 m^2 in a Class 5, 6, 7 or 8 building; or

(D) a space which is otherwise inaccessible to persons at all times when the door is locked; or

(iii) serves the secure parts of a bank, *detention centre*, mental health facility, *early childhood centre* or the like and it can be immediately unlocked—

(A) by operating a fail-safe control switch, not contained within a protective enclosure, to actuate a device to unlock the door; or

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(B) by hand by a person or persons, specifically nominated by the owner, properly instructed as to the duties and responsibilities involved and available at all times when the building is lawfully occupied so that persons in the building or part may immediately escape if there is a fire; or

(iv) is fitted with a fail-safe device which *automatically* unlocks the door upon the activation of any sprinkler system complying with **Specification E1.5** or smoke, or any other detector system deemed suitable in accordance with AS 1670.1 installed throughout the building; or

(v) is in a Class 9a or 9c building and—

(A) is one leaf of a two-leaf door complying with **D1.6(f)(i)** or **D1.6(f)(iv)** provided that it is not held closed by a locking mechanism and is readily openable; and

(B) the door is not *required* to be a fire door or smoke door.

(b) The requirements of **(a)** do not apply in a Class 9b building (other than a *school*, an *early childhood centre* or a building used for religious purposes) to a door in a *required exit*, forming part of a *required exit* or in the path of travel to a *required exit* serving a *storey* or room accommodating more than 100 persons, determined in accordance with **D1.13**, in which case it must be readily openable—

(i) without a key from the side that faces a person seeking egress; and

(ii) by a single hand pushing action on a single device such as a panic bar located between 900 mm and 1.1 m from the floor; and

(iii) where a two-leaf door is fitted, the provisions of **(i)** and **(ii)** need only apply to one door leaf if the appropriate requirements of **D1.6** are satisfied by the opening of that one leaf.

NSW D2.21(b) and (c)

Vic D2.21(a)(vi)

D2.22 Re-entry from fire-isolated exits

(a) Doors of a fire-isolated *exit* must not be locked from the inside as follows:

(i) In a Class 9a *health-care building*.

(ii) In a Class 9c *aged care building*.

(iii) In a fire-isolated *exit* serving any storey above an *effective height* of 25 m, throughout the *exit*.

(b) The requirements of **(a)** do not apply to a door fitted with a fail-safe device that *automatically* unlocks the door upon the activation of a fire alarm and—

(i) on at least every fourth *storey*, the doors are not able to be locked and a sign is fixed on such doors stating that re-entry is available; or

(ii) an intercommunication system, or an audible or visual alarm system, operated from within the enclosure is provided near the doors and a sign is fixed adjacent to such doors explaining its purpose and method of operation.

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D2.23 Signs on doors

(a) A sign, to alert persons that the operation of certain doors must not be impaired, must be installed where it can readily be seen on, or adjacent to, a—

(i)

(A) *required* fire door providing direct access to a fire-isolated *exit*, except a door providing direct egress from a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part; and

(B) *required* smoke door,

on the side of the door that faces a person seeking egress and, if the door is fitted with a device for holding it in the open position, on either the wall adjacent to the doorway or both sides of the door; and

(ii)

(A) fire door forming part of a *horizontal exit*; and

(B) smoke door that swings in both directions; and

(C) door leading from a fire isolated *exit* to a road or *open space*,

on each side of the door.

(b) A sign referred to in **(a)** must be in capital letters not less than 20 mm high in a colour contrasting with the background and state—

(i) for an *automatic* door held open by an *automatic* hold-open device—

"**FIRE SAFETY DOOR—DO NOT OBSTRUCT**"; or

(ii) for a *self-closing* door—

"**FIRE SAFETY DOOR**

DO NOT OBSTRUCT

DO NOT KEEP OPEN"; or

(iii) for a door discharging from a fire-isolated *exit*—

"**FIRE SAFETY DOOR—DO NOT OBSTRUCT**".

NSW D2.101

PART D3 ACCESS FOR PEOPLE WITH A DISABILITY

Deemed-to-Satisfy Provisions

D3.0 Deemed-to-Satisfy Provisions

Tas D3.0

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **DP1** to **DP9** are satisfied by complying with—

(i) **D1.1** to **D1.16**, **D2.1** to **D2.23** and **D3.1** to **D3.12**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**; and

(iv) for public transport buildings, **Part H2**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **D1.1** to **D1.16**, **D2.1** to **D2.23** and **D3.1** to **D3.12**; and

(ii) in a building containing an *atrium*, **Part G3**; and

(iii) for theatres, *stages* and public halls, **Part H1**; and

(iv) for public transport buildings, **Part H2**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

D3.1 General building access requirements

SA D3.1

Buildings and parts of buildings must be *accessible* as *required* by **Table D3.1**, unless exempted by **D3.4**.

Table D3.1 REQUIREMENTS FOR ACCESS FOR PEOPLE WITH A DISABILITY

Class of building	Access requirements
Class 1b	
(a) Dwellings located on one allotment(1) and used for short-term holiday accommodation, consisting of—	To and within—
(i) 4 to 10 dwellings	1 dwelling
(ii) 11 to 40 dwellings	2 dwellings
(iii) 41 to 60 dwellings	3 dwellings
(iv) 61 to 80 dwellings	4 dwellings

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Table D3.1 REQUIREMENTS FOR ACCESS FOR PEOPLE WITH A DISABILITY (Continued)

Class of building	Access requirements
(v) 81 to 100 dwellings	5 dwellings
(vi) more than 100 dwellings	5 dwellings plus 1 additional dwelling for each additional 30 dwellings or part thereof in excess of 100 dwellings.
(b) A boarding house, bed and breakfast, guest house, hostel or the like, other than those described in (a)	To and within— 1 bedroom and associated sanitary facilities; and not less than 1 of each type of room or space for use in common by the residents or guests, including a cooking facility, sauna, gymnasium, *swimming pool*, laundry, games room, eating area, or the like; and rooms or spaces for use in common by all residents on a floor to which access by way of a ramp complying with AS 1428.1 or a passenger lift is provided.
(1) A community or strata-type subdivision or development is considered to be on a single allotment.	
Class 2	
Common areas	From a pedestrian entrance *required* to be *accessible* to at least 1 floor containing *sole-occupancy units* and to the entrance doorway of each *sole-occupancy unit* located on that level. To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, *swimming pool*, common laundry, games room, individual shop, eating area, or the like. Where a ramp complying with AS 1428.1 or a passenger lift is installed— (a) to the entrance doorway of each *sole-occupancy unit*; and

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Table D3.1 REQUIREMENTS FOR ACCESS FOR PEOPLE WITH A DISABILITY (Continued)

Class of building	Access requirements
	(b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp.
Class 3	
Common areas	From a pedestrian entrance *required* to be *accessible* to at least 1 floor containing *sole-occupancy units* and to the entrance doorway of each *sole-occupancy unit* located on that level. To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, *swimming pool*, common laundry, games room, TV room, individual shop, dining room, public viewing area, ticket purchasing service, lunch room, lounge room, or the like. Where a ramp complying with AS 1428.1 or a passenger lift is installed— (a) to the entrance doorway of each *sole-occupancy unit*; and (b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp.
Sole-occupancy units	Not more than 2 *required accessible sole-occupancy units* may be located adjacent to each other. Where more than 2 *accessible sole-occupancy units* are *required*, they must be representative of the range of rooms available

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Table D3.1 REQUIREMENTS FOR ACCESS FOR PEOPLE WITH A DISABILITY (Continued)

Class of building	Access requirements
If the building or group of buildings contain—	To and within—
1 to 10 *sole-occupancy units*	1 *accessible sole-occupancy unit*.
11 to 40 *sole-occupancy units*	2 *accessible sole-occupancy units*.
41 to 60 *sole-occupancy units*	3 *accessible sole-occupancy units*.
61 to 80 *sole-occupancy units*	4 *accessible sole-occupancy units*.
81 to 100 *sole-occupancy units*	5 *accessible sole-occupancy units*.
101 to 200 *sole-occupancy units*	5 *accessible sole-occupancy units* plus 1 additional *accessible sole-occupancy unit* for every 25 units or part thereof in excess of 100.
201 to 500 *sole-occupancy units*	9 *accessible sole-occupancy units* plus 1 additional *accessible sole-occupancy unit* for every 30 units or part thereof in excess of 200.
more than 500 *sole-occupancy units*	19 *accessible sole-occupancy units* plus 1 additional *accessible sole-occupancy unit* for every 50 units or part thereof in excess of 500.
Class 5	To and within all areas normally used by the occupants.
Class 6	To and within all areas normally used by the occupants.
Class 7a	To and within any level containing *accessible* carparking spaces.
Class 7b	To and within all areas normally used by the occupants.
Class 8	To and within all areas normally used by the occupants.
Class 9a	To and within all areas normally used by the occupants.
Class 9b	
Schools and *early childhood centres*	To and within all areas normally used by the occupants.

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Table D3.1 REQUIREMENTS FOR ACCESS FOR PEOPLE WITH A DISABILITY (Continued)

Class of building	Access requirements
An *assembly building* not being a *school* or an *early childhood centre*	To wheelchair seating spaces provided in accordance with **D3.9**. To and within all other areas normally used by the occupants, except that access need not be provided to tiers or platforms of seating areas that do not contain wheelchair seating spaces.
Class 9c	
Common areas	From a pedestrian entrance *required* to be *accessible* to at least 1 floor containing *sole-occupancy units* and to the entrance doorway of each *sole-occupancy unit* located on that level. To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, *swimming pool*, common laundry, games room, TV room, individual shop, dining room, public viewing area, ticket purchasing service, lunch room, lounge room, or the like. Where a ramp complying with AS 1428.1 or a passenger lift is installed— (a) to the entrance doorway of each *sole-occupancy unit*; and (b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp.
Sole-occupancy units	Where more than 2 *accessible sole-occupancy units* are *required*, they must be representative of the range of rooms available.
If the building or group of buildings contain—	To and within—
1 to 10 *sole-occupancy units*	1 *accessible sole-occupancy unit*.
11 to 40 *sole-occupancy units*	2 *accessible sole-occupancy units*.
41 to 60 *sole-occupancy units*	3 *accessible sole-occupancy units*.
61 to 80 *sole-occupancy units*	4 *accessible sole-occupancy units*.

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Table D3.1 REQUIREMENTS FOR ACCESS FOR PEOPLE WITH A DISABILITY (Continued)

Class of building	Access requirements
81 to 100 *sole-occupancy units*	5 *accessible sole-occupancy units*.
101 to 200 *sole-occupancy units*	5 *accessible sole-occupancy units* plus 1 additional *sole-occupancy unit* for every 25 units or part thereof in excess of 100.
201 to 500 *sole-occupancy units*	9 *accessible sole-occupancy units* plus 1 additional *sole-occupancy unit* for every 30 units or part thereof in excess of 200.
more than 500 *sole-occupancy units*	19 *accessible sole-occupancy units* plus 1 additional *sole-occupancy unit* for every 50 units or part thereof in excess of 500.
Class 10a	
Non-habitable building located in an *accessible* area intended for use by the public and containing a sanitary facility, change room facility or shelter	To and within— (a) An *accessible* sanitary facility, and (b) a change room facility, and (c) a public shelter or the like.
Class 10b	
Swimming pool	To and into *swimming pools* with a total perimeter greater than 40 m, associated with a Class 1b, 2, 3, 5, 6, 7, 8 or 9 building that is *required* to be *accessible*, but not *swimming pools* for the exclusive use of occupants of a Class 1b building or a *sole-occupancy unit* in a Class 2 or Class 3 building.

SA Table D3.1a

D3.2 Access to buildings

(a) An *accessway* must be provided to a building *required* to be *accessible*—

(i) from the main points of a pedestrian entry at the allotment boundary; and

(ii) from another *accessible* building connected by a pedestrian link; and

(iii) from any *required accessible* carparking space on the allotment.

(b) In a building *required* to be *accessible*, an *accessway* must be provided through the principal pedestrian entrance, and—

(i) through not less than 50% of all pedestrian entrances including the principal pedestrian entrance; and

(ii) in a building with a total *floor area* more than 500 m^2, a pedestrian entrance which is not *accessible* must not be located more than 50 m from an *accessible* pedestrian entrance,

except for pedestrian entrances serving only areas exempted by **D3.4**.

(c) Where a pedestrian entrance *required* to be *accessible* has multiple doorways—

(i) if the pedestrian entrance consists of not more than 3 doorways — not less than 1 of those doorways must be *accessible*; and

(ii) if a pedestrian entrance consists of more than 3 doorways — not less than 50% of those doorways must be *accessible*.

(d) For the purposes of **(c)**—

(i) an *accessible* pedestrian entrance with multiple doorways is considered to be one pedestrian entrance where—

(A) all doorways serve the same part or parts of the building; and

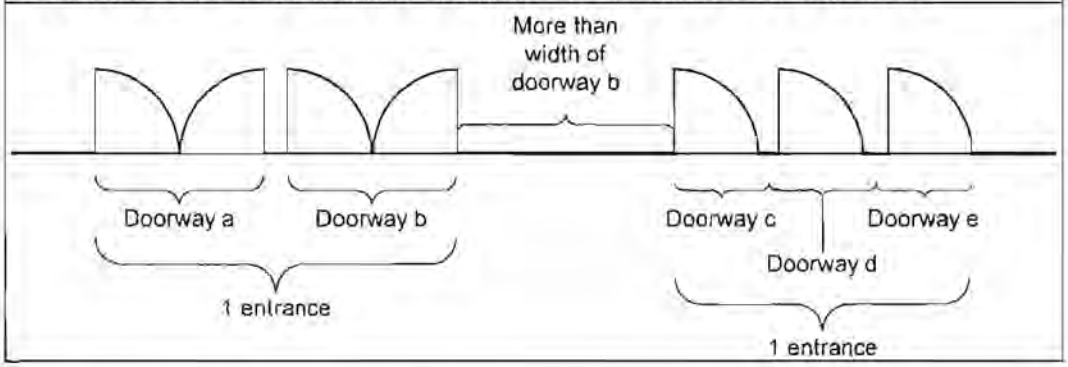
(B) the distance between each doorway is not more than the width of the widest doorway at that pedestrian entrance (see **Figure D3.2**); and

(ii) a doorway is considered to be the clear, unobstructed opening created by the opening of one or more door leaves (see **Figure D3.2**).

(e) Where a doorway on an *accessway* has multiple leaves, (except an automatic opening door) one of those leaves must have a clear opening width of not less than 850 mm in accordance with AS 1428.1.

Figure D3.2

DOORWAYS AND PEDESTRIAN ENTRANCES FOR ACCESS PURPOSES



D3.3 Parts of buildings to be accessible

In a building *required* to be *accessible*—

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(a) every ramp and stairway, except for ramps and stairways in areas exempted by **D3.4**, must comply with—

(i) for a ramp, except a *fire-isolated ramp*, clause 10 of AS 1428.1; and

(ii) for a stairway, except a *fire-isolated stairway*, clause 11 of AS 1428.1; and

(iii) for a *fire-isolated stairway*, clause 11.1(f) and (g) of AS 1428.1; and

(b) every passenger lift must comply with **E3.6**; and

(c) *accessways* must have—

(i) passing spaces complying with AS 1428.1 at maximum 20 m intervals on those parts of an *accessway* where a direct line of sight is not available; and

(ii) turning spaces complying with AS 1428.1—

(A) within 2 m of the end of *accessways* where it is not possible to continue travelling along the *accessway*; and

(B) at maximum 20 m intervals along the *accessway*; and

(d) an intersection of *accessways* satisfies the spatial requirements for a passing and turning space; and

(e) a passing space may serve as a turning space; and

(f) a ramp complying with AS 1428.1 or a passenger lift need not be provided to serve a *storey* or level other than the entrance *storey* in a Class 5, 6, 7b or 8 building—

(i) containing not more than 3 *storeys*; and

(ii) with a *floor area* for each *storey*, excluding the entrance *storey*, of not more than 200 m^2; and

(g) clause 7.4.1(a) of AS 1428.1 does not apply and is replaced with 'the pile height or pile thickness shall not exceed 11 mm and the carpet backing thickness shall not exceed 4 mm'; and

(h) the carpet pile height or pile thickness dimension, carpet backing thickness dimension and their combined dimension shown in figure 8 of AS 1428.1 do not apply and are replaced with 11 mm, 4 mm and 15 mm respectively.

D3.4 Exemptions

The following areas are not *required* to be *accessible*:

(a) An area where access would be inappropriate because of the particular purpose for which the area is used.

(b) An area that would pose a health or safety risk for people with a disability.

(c) Any path of travel providing access only to an area exempted by **(a)** or **(b)**.

D3.5 Accessible carparking

Accessible carparking spaces—

(a) subject to **(b)**, must be provided in accordance with **Table D3.5** in—

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(i) a Class 7a building *required* to be *accessible*; and

(ii) a carparking area on the same allotment as a building *required* to be *accessible*; and

(b) need not be provided in a Class 7a building or a carparking area where a parking service is provided and direct access to any of the carparking spaces is not available to the public; and

(c) subject to **(d)**, must comply with AS/NZS 2890.6; and

(d) need not be designated where there is a total of not more than 5 carparking spaces, so as to restrict the use of the carparking space only for people with a disability.

Table D3.5 CARPARKING SPACES FOR PEOPLE WITH A DISABILITY

Class of building to which the *carpark* or carparking area is associated	**Number of *accessible* carparking spaces *required***
Class 1b and 3	
(a) Boarding house, guest house, hostel, lodging house, backpackers accommodation, or the residential part of a hotel or motel.	To be calculated by multiplying the total number of carparking spaces by the percentage of— (i) *accessible sole-occupancy units* to the total number of *sole-occupancy units*; or (ii) *accessible* bedrooms to the total number of bedrooms; and the calculated number is to be taken to the next whole figure.
(b) Residential part of a *school*, accommodation for the aged, disabled or children, residential part of a *health-care building* which accommodates members of staff or the residential part of a *detention centre*.	1 space for every 100 carparking spaces or part thereof.
Class 5, 7, 8 and 9c	1 space for every 100 carparking spaces or part thereof.
Class 6	
(a) Up to 1000 carparking spaces; and	1 space for every 50 carparking spaces or part thereof.
(b) for each additional 100 carparking spaces or part thereof in excess of 1000 carparking spaces.	1 space.
Class 9a	
(a) Hospital (non-outpatient area)	1 space for every 100 carparking spaces or part thereof.

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Table D3.5 CARPARKING SPACES FOR PEOPLE WITH A DISABILITY (Continued)

Class of building to which the *carpark* or carparking area is associated	Number of *accessible* carparking spaces *required*
(b) Hospital (outpatient area)—	
(i) up to 1000 carparking spaces; and	1 space for every 50 carparking spaces or part thereof.
(ii) for each additional 100 carparking spaces or part thereof in excess of 1000 carparking spaces.	1 space.
(c) Nursing home	1 space for every 100 carparking spaces or part thereof.
(d) Clinic or day surgery not forming part of a hospital.	1 space for every 50 carparking spaces or part thereof.
Class 9b	
(a) *School*	1 space for every 100 carparking spaces or part thereof.
(b) Other *assembly building*—	
(i) up to 1000 carparking spaces; and	1 space for every 50 carparking spaces or part thereof.
(ii) for each additional 100 carparking spaces or part thereof in excess of 1000 carparking spaces.	1 space.

D3.6 Signage

In a building *required* to be *accessible*—

(a) braille and tactile signage complying with **Specification D3.6** and incorporating the international symbol of access or deafness, as appropriate, in accordance with AS 1428.1 must identify each—

(i) sanitary facility, except a sanitary facility within a *sole-occupancy unit* in a Class 1b or Class 3 building; and

(ii) space with a hearing augmentation system; and

(b) signage including the international symbol for deafness in accordance with AS 1428.1 must be provided within a room containing a hearing augmentation system identifying—

(i) the type of hearing augmentation; and

(ii) the area covered within the room; and

(iii) if receivers are being used and where the receivers can be obtained; and

(c) signage in accordance with AS 1428.1 must be provided for *accessible* unisex sanitary facilities to identify if the facility is suitable for left or right handed use; and

(d) signage to identify an ambulant *accessible* sanitary facility in accordance with AS 1428.1 must be located on the door of the facility; and

(e) where a pedestrian entrance is not *accessible*, directional signage incorporating the international symbol of access, in accordance with AS 1428.1 must be provided to direct a person to the location of the nearest *accessible* pedestrian entrance; and

(f) where a bank of sanitary facilities is not provided with an *accessible* unisex sanitary facility, directional signage incorporating the international symbol of access in accordance with AS 1428.1 must be placed at the location of the sanitary facilities that are not *accessible*, to direct a person to the location of the nearest *accessible* unisex sanitary facility.

D3.7 Hearing augmentation

(a) A hearing augmentation system must be provided where an inbuilt amplification system, other than one used only for emergency warning, is installed—

  (i) in a room in a Class 9b building; or

  (ii) in an auditorium, conference room, meeting room or room for judicatory purposes; or

  (iii) at any ticket office, teller's booth, reception area or the like, where the public is screened from the service provider.

(b) If a hearing augmentation system *required* by **(a)** is—

  (i) an induction loop, it must be provided to not less than 80% of the *floor area* of the room or space served by the inbuilt amplification system; or

  (ii) a system requiring the use of receivers or the like, it must be available to not less than 95% of the *floor area* of the room or space served by the inbuilt amplification system, and the number of receivers provided must not be less than—

    (A) if the room or space accommodates up to 500 persons, 1 receiver for every 25 persons or part thereof, or 2 receivers, whichever is the greater; and

    (B) if the room or space accommodates more than 500 persons but not more than 1000 persons, 20 receivers plus 1 receiver for every 33 persons or part thereof in excess of 500 persons; and

    (C) if the room or space accommodates more than 1000 persons but not more than 2000 persons, 35 receivers plus 1 receiver for every 50 persons or part thereof in excess of 1000 persons; and

    (D) if the room or space accommodates more than 2000 persons, 55 receivers plus 1 receiver for every 100 persons or part thereof in excess of 2000 persons.

(c) The number of persons accommodated in the room or space served by an inbuilt amplification system must be calculated according to **D1.13**.

(d) Any screen or scoreboard associated with a Class 9b building and capable of displaying public announcements must be capable of supplementing any public address system, other than a public address system used for emergency warning purposes only.

D3.8 Tactile indicators

(a) For a building *required* to be *accessible*, tactile ground surface indicators must be provided to warn people who are blind or have a vision impairment that they are approaching—

(i) a stairway, other than a *fire-isolated stairway*; and

(ii) an escalator; and

(iii) a passenger conveyor or moving walk; and

(iv) a ramp other than a *fire-isolated ramp*, step ramp, kerb ramp or *swimming pool* ramp; and

(v) in the absence of a suitable barrier—

(A) an overhead obstruction less than 2 m above floor level, other than a doorway; and

(B) an *accessway* meeting a vehicular way adjacent to any pedestrian entrance to a building, excluding a pedestrian entrance serving an area referred to in **D3.4**, if there is no kerb or kerb ramp at that point,

except for areas exempted by **D3.4**.

(b) Tactile ground surface indicators *required* by **(a)** must comply with sections 1 and 2 of AS/NZS 1428.4.1.

(c) A hostel for the aged, nursing home for the aged, a *residential aged care building* Class 3 accommodation for the aged, Class 9a *health-care building* or a Class 9c *aged care building* need not comply with **(a)(i)** and **(iv)** if handrails incorporating a raised dome button in accordance with the requirements for stairway handrails in AS 1428.1 are provided to warn people who are blind or have a vision impairment that they are approaching a stairway or ramp.

D3.9 Wheelchair seating spaces in Class 9b assembly buildings

Where fixed seating is provided in a Class 9b *assembly building*, wheelchair seating spaces complying with AS 1428.1 must be provided in accordance with the following:

(a) The number and grouping of wheelchair seating spaces must be in accordance with **Table D3.9**.

(b) In a cinema—

(i) with not more than 300 seats — wheelchair seating spaces must not be located in the front row of seats; and

(ii) with more than 300 seats — not less than 75% of *required* wheelchair seating spaces must be located in rows other than the front row of seats; and

Deemed-to-Satisfy Provisions

(iii) the location of wheelchair seating is to be representative of the range of seating provided.

Table D3.9 WHEELCHAIR SEATING SPACES IN CLASS 9b ASSEMBLY BUILDINGS

Number of fixed seats in a room or space	Number of wheelchair seating spaces	Grouping and location
Up to 150	3 spaces	1 single space; and 1 group of 2 spaces.
151 to 800	3 spaces; plus 1 additional space for each additional 50 seats or part thereof in excess of 150 seats	Not less than 1 single space; and not less than 1 group of 2 spaces; and not more than 5 spaces in any other group.
801 to 10 000	16 spaces; plus 1 additional space for each additional 100 seats or part thereof in excess of 800 seats	Not less than 2 single spaces; and not less than 2 groups of 2 spaces; and not more than 5 spaces in any other group; and the location of spaces is to be representative of the range of seating provided.
More than 10 000	108 spaces; plus 1 additional space for each additional 200 seats or part thereof in excess of 10 000 seats	Not less than 5 single spaces; and not less than 5 groups of 2 spaces; and not more than 10 spaces in any other group; and the location of spaces is to be representative of the range of seating provided.

D3.10 Swimming pools

(a) Not less than 1 means of *accessible* water entry/exit in accordance with **Specification D3.10** must be provided for each *swimming pool required* by **Table D3.1** to be *accessible*.

(b) An *accessible* entry/exit must be by means of—

(i) a fixed or movable ramp and an aquatic wheelchair; or

(ii) a zero depth entry at a maximum gradient of 1:14 and an aquatic wheelchair; or

(iii) a platform *swimming pool* lift and an aquatic wheelchair; or

(iv) a sling-style *swimming pool* lift.

(c) Where a *swimming pool* has a perimeter of more than 70 m in length, at least one *accessible* water entry/exit must be provided by a means specified in **(b)(i), (ii) or (iii)**.

(d) Latching devices on gates and doors forming part of a *swimming pool* safety barrier need not comply with AS 1428.1.

D3.11 Ramps

On an *accessway*—

(a) a series of connected ramps must not have a combined vertical rise of more than 3.6 m; and

(b) a landing for a step ramp must not overlap a landing for another step ramp or ramp.

D3.12 Glazing on an accessway

On an *accessway*, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1.

SPECIFICATION D1.12 NON-REQUIRED STAIRWAYS, RAMPS AND ESCALATORS

Deemed-to-Satisfy Provisions

1. Scope

This Specification contains the requirements to allow non-*required* stairways, ramps or escalators to connect any number of *storeys* in a Class 5 or 6 building. The requirements do not apply in an *atrium* or outside a building.

2. Requirements

An escalator, moving walkway or non-*required* non-*fire-isolated stairway* or pedestrian ramp must comply with the following:

(a) The escalator, walkway, stairway or ramp must be bounded by a *shaft* of:

  (i) construction with an FRL of not less than 120/120/120 if *loadbearing* or –/120/120 if non-*loadbearing* and if of *lightweight construction* must comply with **Specification C1.8**; or

  (ii) glazed construction with an FRL of not less than –/60/30 protected by a wall wetting system in accordance with **Clause 2.4 of Specification G3.8**.

(b) The void of each non-*required* stairway, ramp or escalator must not connect more than 2 *storeys*.

(c) Rising and descending escalators, walkways, stairways and ramps within one *shaft* must be separated by construction with an FRL of not less than –/60/30.

(d) Openings into the *shaft* must be protected by fire doors with an FRL not less than –/60/30.

(e) When the fire door is in the closed position, the floor or any covering over the floor beneath the fire door must not be *combustible*.

(f) Fire doors must be fitted with smoke seals and the assembly must be tested in accordance with AS 1530.4.

(g) Fire doors must be—

  (i) closed and locked for security reasons; or

  (ii) held open and be *automatic* closing.

(h) Smoke detectors must be installed on both sides of the opening, not more than 1.5 m horizontal distance from the opening.

(i) In the closed position, fire doors must be openable on a single hand downward action or horizontal pushing action on a single device within the *shaft* and by key only from outside the *shaft*.

(j) A warning sign must be displayed where it can readily be seen outside the *shaft* near all fire doors opening to the *shaft*. The sign must comply with the details and dimensions of **Figure 2**.

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Figure 2 WARNING SIGN FOR NON-REQUIRED STAIRWAY, RAMP OR ESCALATOR

DO NOT USE THIS STAIRWAY IF THERE IS A FIRE	=20 mm
OR	
Do not use this stairway if there is a fire	=16 mm

(k) All doors opening into the *shaft* must be within 20 m of a *required exit*.

(l) Signs showing the direction of the nearest *required exit* must be installed where they can be readily seen.

(m) Materials attached to any wall, ceiling or floor within the *shaft* must comply with **Specification C1.10**.

(n) Emergency lighting must be installed in the *shaft* in accordance with **E4.4**.

(o) No step or ramp may be closer to the threshold of the doorway than the width of the door leaf.

SPECIFICATION D3.6 BRAILLE AND TACTILE SIGNS

1. Scope

This Specification sets out the requirements for the design and installation of braille and tactile signage as *required* by **D3.6**.

2. Location of braille and tactile signs

Signs including symbols, numbering and lettering must be designed and installed as follows:

(a) Braille and tactile components of a sign must be located not less than 1200 mm and not higher than 1600 mm above the floor or ground surface.

(b) Signs with single lines of characters must have the line of tactile characters not less than 1250 mm and not higher than 1350 mm above the floor or ground surface.

(c) Signs identifying rooms containing features or facilities listed in **D3.6** must be located—

  (i) on the wall on the latch side of the door with the leading edge of the sign located between 50 mm and 300 mm from the architrave; and

  (ii) where **(i)** is not possible, the sign may be placed on the door itself.

3. Braille and tactile sign specification

(a) Tactile characters must be raised or embossed to a height of not less than 1 mm and not more than 1.5 mm.

(b) Sentence case (upper case for the first letter of each main word and lower case for all other letters) must be used for all tactile characters, and—

  (i) upper case tactile characters must have a height of not less than 15 mm and not more than 55 mm; and

  (ii) lower case tactile characters must have a height of 50% of the related upper case characters.

(c) Tactile characters, symbols, and the like, must have rounded edges.

(d) The entire sign, including any frame, must have all edges rounded.

(e) The background, negative space or fill of signs must be of matt or low sheen finish.

(f) The characters, symbols, logos and other features on signs must be matt or low sheen finish.

(g) The minimum letter spacing of tactile characters on signs must be 2 mm.

(h) The minimum word spacing of tactile characters on signs must be 10 mm.

(i) The thickness of letter strokes must be not less than 2 mm and not more than 7 mm.

(j) Tactile text must be left justified, except that single words may be centre justified.

(k) Tactile text must be Arial typeface.

4. Luminance contrast

The following applies to *luminance contrast*:

(a) The background, negative space, fill of a sign or border with a minimum width of 5 mm must have a *luminance contrast* with the surface on which it is mounted of not less than 30%.

(b) Tactile characters, icons and symbols must have a minimum *luminance contrast* of 30% to the surface on which the characters are mounted.

(c) *Luminance contrasts* must be met under the lighting conditions in which the sign is to be located.

5. Lighting

Braille and tactile signs must be illuminated to ensure *luminance contrast* requirements are met at all times during which the sign is required to be read.

6. Braille

The following applies to braille:

(a) Braille must be grade 1 braille (uncontracted) in accordance with the criteria set out by the Australian Braille Authority.

(b) Braille must be raised and domed.

(c) Braille must be located 8 mm below the bottom line of text (not including descenders).

(d) Braille must be left justified.

(e) Where an arrow is used in the tactile sign, a solid arrow must be provided for braille readers.

(f) On signs with multiple lines of text and characters, a semicircular braille locator at the left margin must be horizontally aligned with the first line of braille text.

SPECIFICATION D3.10 ACCESSIBLE WATER ENTRY/EXIT FOR SWIMMING POOLS

1. Scope

This Specification sets out the requirements for types of *accessible* water entry/exit for *swimming pools*.

2. Fixed or moveable ramp

A fixed or moveable ramp must—

(a) have a slip-resistant surface; and

(b) have a maximum gradient of 1:14; and

(c) have handrails complying with the requirements for ramps in AS 1428.1, installed on both sides of the ramp; and

(d) have kerbs in accordance with the requirements for ramps in AS 1428.1; and

(e) extend to a depth of not less than 900 mm and not more than 1100 mm below the stationary water level; and

(f) have landings in accordance with the requirements for ramps in AS 1428.1, with a landing located at the bottom and top of each ramp and a landing must be located at a level between 900 mm and 1100 mm below the stationary water level.

3. Zero depth entry

A zero depth entry must have—

(a) a slip-resistant surface; and

(b) a maximum gradient of 1:14; and

(c) a single handrail complying with the requirements for handrails in AS 1428.1, from the top of the entry point continuous to the bottom level area; and

(d) a level area—

  (i) 1500 mm long for the width of the zero depth entry at the entry point; and

  (ii) located at the bottom of the zero depth entry at a level between 900 mm and 1100 mm below the stationary water level.

4. Platform swimming pool lift

A platform *swimming pool* lift must be—

(a) capable of being operated from the *swimming pool* surround, within the *swimming pool*, and on the platform; and

(b) located where the water depth is not more than 1300 mm; and

(c) designed to withstand a weight capacity of not less than 160 kg and be capable of sustaining a static load of not less than 1.5 times the rated load.

5. Sling-style swimming pool lift

A sling lift must comply with the following:

(a) A sling lift must be located where the water depth is not more than 1300 mm.

(b) When the sling is in the raised position and in the transfer position, the centreline of the sling must be located over the *swimming pool* surround and not less than 450 mm from the *swimming pool* edge.

(c) The surface of the *swimming pool* surround between the centreline of the sling and the *swimming pool* edge must have a gradient of not more than 1:50 and must be slip-resistant.

(d) A clear space—

(i) not less than 900 mm x 1300 mm; and

(ii) with a gradient of not more than 1:50; and

(iii) having a slip-resistant surface; and

(iv) located so that the centreline of the space is directly below the lifting point for the sling,

must be provided on the *swimming pool* surround parallel with the *swimming pool* edge on the side remote from the water (see **Figure 5**).

(e) A sling lift must be capable of being operated from the *swimming pool* surround, within the *swimming pool* and from the sling.

(f) A sling must be designed so that it will submerge to a water depth of not less than 500 mm below the stationary water level.

(g) A sling lift must be designed to withstand a weight of not less than 136 kg and be capable of sustaining a static load not less than 1.5 times the rated load.

Figure 5

CLEAR SWIMMING POOL SURROUND SPACE FOR SLING LIFT

Diagram a. **Clear pool surround space for sling lift**

Plan view

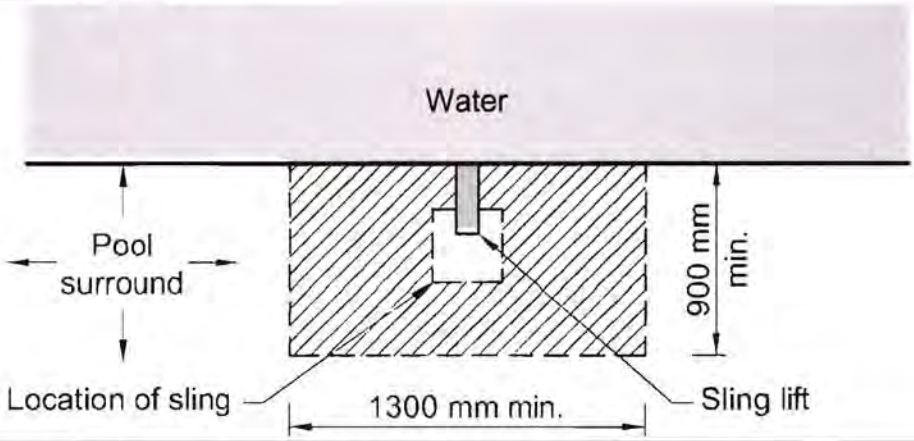
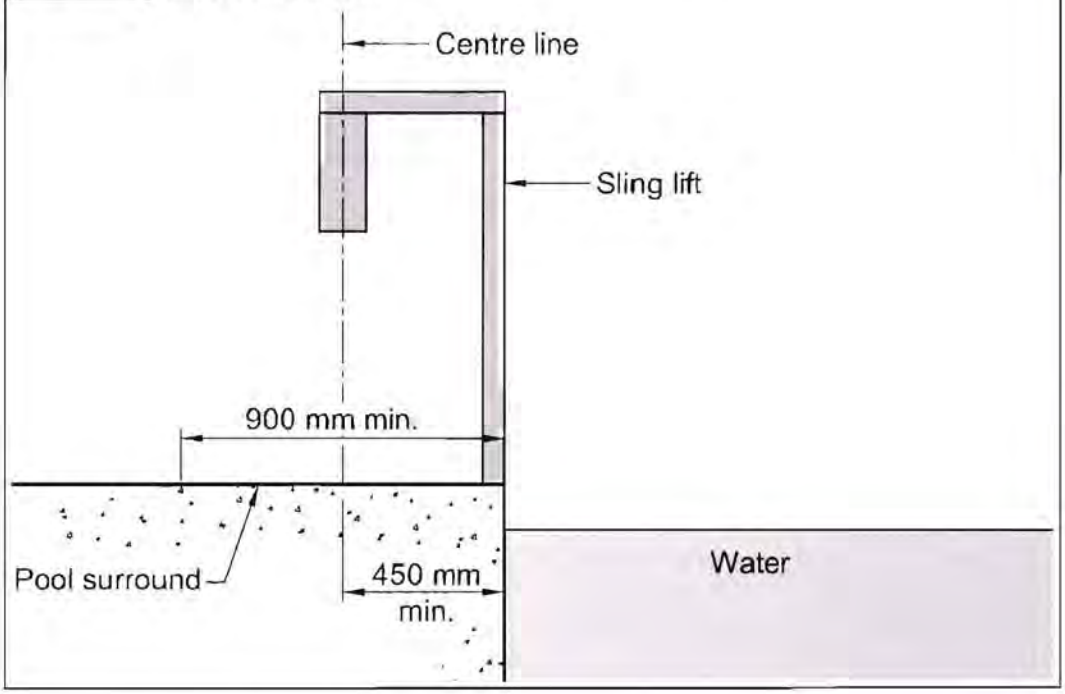


Diagram b. **Clear space for sling lift in the transfer position**

Sectional elevation



6. Aquatic wheelchair

An aquatic wheelchair must comply with the following:

(a) The height of the top surface of the seat must be not less than 430 mm.

(b) The seat width must not be not less than 480 mm.

(c) A footrest must be provided.

(d) Armrests must be located on both sides of the seat and must be capable of being moved away from the side of the chair to allow a person to transfer on and off the seat.

SECTION E

SERVICES AND EQUIPMENT

SECTION E CONTENTS

PART E1 FIRE FIGHTING EQUIPMENT

OBJECTIVE

EO1

The *Objective* of this Part is to—

(a) safeguard occupants from illness or injury while evacuating during a fire; and

(b) provide facilities for occupants and the *fire brigade* to undertake fire-fighting operations; and

(c) prevent the spread of fire between buildings.

TAS EO1(d)

FUNCTIONAL STATEMENT

EF1.1

A building is to be provided with fire-fighting equipment to safeguard against fire spread—

(a) to allow occupants time to evacuate safely without being overcome by the effects of fire; and

(b) so that occupants may undertake initial attack on a fire; and

(c) so that the *fire brigade* have the necessary equipment to undertake search, rescue, and fire-fighting operations; and

(d) to other parts of the building; and

(e) between buildings.

TAS EF1.2

PERFORMANCE REQUIREMENTS

EP1.1

A fire hose reel system must be installed to the degree necessary to allow occupants to safely undertake initial attack on a fire appropriate to—

(a) the size of the *fire compartment*; and

(b) the function or use of the building; and

(c) any other *fire safety systems* installed in the building; and

(d) the *fire hazard*.

EP1.2

Fire extinguishers must be installed to the degree necessary to allow occupants to undertake initial attack on a fire appropriate to—

(a) the function or use of the building; and

(b) any other *fire safety systems* installed in the building; and

(c) the *fire hazard*.

EP1.3

A fire hydrant system must be provided to the degree necessary to facilitate the needs of the *fire brigade* appropriate to—

(a) fire-fighting operations; and

(b) the *floor area* of the building; and

(c) the *fire hazard*.

Application:

EP1.3 only applies to a building where a *fire brigade* is available to attend.

EP1.4

An *automatic* fire suppression system must be installed to the degree necessary to control the development and spread of fire appropriate to—

(a) the size of the *fire compartment*; and

(b) the function or use of the building; and

(c) the *fire hazard*; and

(d) the height of the building.

EP1.5

Suitable means of fire-fighting must be installed to the degree necessary in a building under construction to allow initial fire attack by construction workers and for the *fire brigade* to undertake attack on the fire appropriate to—

(a) the *fire hazard*; and

(b) the height the building has reached during its construction.

EP1.6

Suitable facilities must be provided to the degree necessary in a building to co-ordinate *fire brigade* intervention during an emergency appropriate to—

(a) the function or use of the building; and

(b) the *floor area* of the building; and

(c) the height of the building.

TAS EP1.7

PART E1 FIRE FIGHTING EQUIPMENT

Deemed-to-Satisfy Provisions

E1.0 Deemed-to-Satisfy Provisions

Tas E1.0

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **EP1.1** to **EP1.6** are satisfied by complying with **E1.1** to **E1.10**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **E1.1** to **E1.10**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

E1.1 * * * * *

This clause has deliberately been left blank.

E1.2 * * * * *

This clause has deliberately been left blank.

E1.3 Fire hydrants

(a) A fire hydrant system must be provided to serve a building—

  (i) having a total *floor area* greater than 500 m^2; and

  (ii) where a *fire brigade* is available to attend a building fire.

(b) The fire hydrant system—

  (i) must be installed in accordance with AS 2419.1, except a Class 8 *electricity network substation* need not comply with clause 4.2 of AS 2419.1 if—

    (A) it cannot be connected to town main supply; and

    (B) one hour water storage is provided for firefighting; and

  (ii) where internal fire hydrants are provided, they must serve only the *storey* on which they are located except that a *sole-occupancy unit*—

    (A) in a Class 2 or 3 building or Class 4 part may be served by a single fire hydrant located at the level of egress from that *sole-occupancy unit*; or

    (B) of not more than 2 *storeys* in a Class 5, 6, 7, 8 or 9 building may be served by a single fire hydrant located at the level of egress from that *sole-occupancy unit* provided the fire hydrant can provide coverage to the whole of the *sole-occupancy unit*.

Deemed-to-Satisfy Provisions

E1.4 Fire hose reels

(a) E1.4 does not apply to—

(i) a Class 8 *electricity network substation*; or

(ii) a Class 9c *aged care building*; or

(iii) classrooms and associated corridors in a primary or secondary *school*.

(b) A fire hose reel system must be provided—

(i) to serve the whole building where one or more internal fire hydrants are installed; or

(ii) where internal fire hydrants are not installed, to serve any *fire compartment* with a *floor area* greater than 500 m^2, and for the purposes of this clause, a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part is considered to be a *fire compartment*.

(c) The fire hose reel system must—

(i) have fire hose reels installed in accordance with AS 2441; and

(ii) provide fire hose reels to serve only the *storey* at which they are located, except a *sole-occupancy unit*—

(A) in a Class 2 or 3 building or Class 4 part may be served by a single fire hose reel located at the level of egress from that *sole-occupancy unit*; and

(B) of not more than 2 *storeys* in a Class 5, 6, 7, 8 or 9 building may be served by a single fire hose reel located at the level of egress from that *sole-occupancy unit* provided the fire hose reel can provide coverage to the whole of the *sole-occupancy unit*.

(d) Fire hose reels must be located internally, externally or in combination, to achieve the system coverage specified in AS 2441.

(e) In achieving system coverage, one or a combination of the following criteria for individual internally located fire hose reels must be met in determining the layout of any fire hose reel system:

(i) Fire hose reels must be located adjacent to an internal fire hydrant (other than one within a fire-isolated *exit*), except that a fire hose reel need not be located adjacent to every fire hydrant, provided system coverage can be achieved.

(ii) Fire hose reels must be located within 4 m of an *exit*, except that a fire hose reel need not be located adjacent to every *exit*, provided system coverage can be achieved.

(iii) Where system coverage is not achieved by compliance with **(i)** and **(ii)**, additional fire hose reels may be located in paths of travel to an *exit* to achieve the *required* coverage.

(f) Fire hose reels must be located so that the fire hose will not need to pass through doorways fitted with fire or smoke doors, except—

(i) doorways in walls referred to in **C2.5(a)(v)** in a Class 9a building and **C2.5(b)(iv)** in a Class 9c building, separating ancillary use areas of high potential *fire hazard*; and

(ii) doorways in walls referred to in **C2.12** or **C2.13** separating equipment or electrical supply systems; and

(iii) doorways in bounding construction in a Class 2 or 3 building or Class 4 part referred to in **C3.11**; and

(iv) doorway openings to *shafts* referred to in **C3.13**.

(g) Where the normal water supply cannot achieve the flow and pressures required by AS 2441, or is unreliable—

(i) a pump; or

(ii) water storage facility; or

(iii) both a pump and water storage facility,

must be installed to provide the minimum flow and pressures required by clause 6.1 of AS 2441.

E1.5 Sprinklers

A sprinkler system must—

(a) be installed in a building or part of a building when *required* by **Table E1.5**; and

(b) comply with **Specification E1.5**.

NT Table E1.5

Vic Table E1.5

Table E1.5 REQUIREMENTS FOR SPRINKLERS

Occupancy	When sprinklers are required
All classes— (a) including an *open-deck carpark* within a multi-classified building; but (b) excluding— (i) an *open-deck carpark* being a separate building; and (ii) a Class 8 *electricity network substation*, with a *floor area* not more than 200m^2, located within a multi-classified building.	Throughout the whole building if any part of the building has an *effective height* of more than 25 m.

Deemed-to-Satisfy Provisions

Table E1.5 REQUIREMENTS FOR SPRINKLERS (Continued)

Occupancy	When sprinklers are required
Class 6	In *fire compartments* where either of the following apply: (a) A *floor area* of more than 3 500 m^2. (b) A volume more than 21 000 m^3.
Class 7a, other than *open-deck carparks*	In *fire compartments* where more than 40 vehicles are accommodated.
Class 9c *aged care building*	Throughout the building and any *fire compartment* containing a Class 9c part.
Class 9b theatres, stages & public halls	see **Part H1**
Atrium construction	see **Part G3**
Large isolated buildings	see **Clause C2.3**
Occupancies of excessive hazard (see Note 3)	In *fire compartments* where either of the following apply: (a) A *floor area* of more than 2 000 m^2. (b) A volume of more than 12 000 m^3.

Notes:

1. See **Specification C1.1** for use of sprinklers in Class 2 buildings and *carparks* generally.
2. See **Part E2** for use of sprinklers to satisfy Smoke Hazard Management provisions.
3. For the purposes of this Table, occupancies of excessive *fire hazard* comprise buildings which contain—
   - (a) hazardous processes or storage including the following:
     - (i) Aircraft hangars.
     - (ii) Cane furnishing manufacture, processing and storage.
     - (iii) Fire-lighter and fireworks manufacture and warehousing.
     - (iv) Foam plastic and foam plastic goods manufacture, processing and warehousing, eg, furniture factory.
     - (v) Hydrocarbon based sheet product, manufacture, processing and warehousing, eg, vinyl floor coverings.
     - (vi) Woodwool and other flammable loose fibrous material manufacture.
   - (b) *Combustible* Goods with an aggregate volume exceeding 1000 m^3 and stored to a height greater than 4 m including the following:
     - (i) Aerosol packs with flammable contents.

Deemed-to-Satisfy Provisions

Table E1.5 REQUIREMENTS FOR SPRINKLERS (Continued)

Occupancy	When sprinklers are required
(ii) Carpets and clothing.	
(iii) Electrical appliances.	
(iv) *Combustible* compressed fibreboards (low and high density) and plywoods.	
(v) *Combustible* cartons, irrespective of content	
(vi) Esparto and other fibrous *combustible* material.	
(vii) Furniture including timber, cane and composite, where foamed rubber or plastics are incorporated.	
(viii) Paper storage (all forms of new or waste) eg, bales, sheet, horizontal or vertical rolls, waxed coated or processed.	
(ix) Textiles raw and finished, eg, rolled cloth, clothing and manchester.	
(x) Timber storage including sheets, planks, boards, joists and cut sizes.	
(xi) Vinyl, plastic, foamed plastic, rubber and other *combustible* sheets, offcuts and random pieces and rolled material storage, eg, carpet, tar paper, linoleum, wood veneer and foam mattresses.	
(xii) All materials having wrappings or preformed containers of foamed plastics.	

E1.6 Portable fire extinguishers

Portable fire extinguishers must be provided as listed in **Table E1.6** and must be selected, located and distributed in accordance with Sections 1, 2, 3 and 4 of AS 2444.

E1.7 * * * * *

This clause has deliberately been left blank.

E1.8 Fire control centres

A fire control centre facility in accordance with **Specification E1.8** must be provided for—

(a) a building with an *effective height* of more than 25 m; and

(b) a Class 6, 7, 8 or 9 building with a total *floor area* of more than 18 000 m^2.

E1.9 Fire precautions during construction

In a building under construction—

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(a) not less than one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on each *storey* adjacent to each *required exit* or temporary stairway or *exit*; and

(b) after the building has reached an *effective height* of 12 m—

(i) the *required* fire hydrants and fire hose reels must be operational in at least every *storey* that is covered by the roof or the floor structure above, except the 2 uppermost *storeys*; and

(ii) any *required* booster connections must be installed.

Table E1.6 REQUIREMENTS FOR EXTINGUISHERS (Note 3)

Occupancy class	Risk class (as defined in AS 2444)
General provisions—Class 2 to 9 (except within *sole-occupancy units* of a Class 2 or 3 building or Class 4 part or *sole-occupancy units* in a Class 9c *aged care building*)	(a) To cover Class AE or E fire risks associated with emergency services switchboards. (Note 1) (b) To cover Class F fire risks involving cooking oils and fats in kitchens. (c) To cover Class B fire risks in locations where flammable liquids in excess of 50 litres are stored or used (not including that held in fuel tanks of vehicles). (d) To cover Class A fire risks in normally occupied *fire compartments* less than 500 m^2 not provided with fire hose reels (excluding *open deck carparks*). (e) To cover Class A fire risks in classrooms and associated corridors in primary and secondary schools not provided with fire hose reels.
Specific provisions (in addition to general provisions)— (a) Class 9a *health care building* (b) Class 3 parts of detention and correctional occupancies (c) Class 3 accommodation for children, aged persons and people with disabilities (d) Class 9c *aged care buildings*	To cover Class A and E fire risks. (Note 2)

Notes

1. For the purposes of this Table, an emergency services switchboard is one which sustains emergency equipment operating in the emergency mode.
2. A Class E fire extinguisher need only be located at each nurses, supervisors station or the like.

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Table E1.6 REQUIREMENTS FOR EXTINGUISHERS (Note 3) (Continued)

Occupancy class	Risk class (as defined in AS 2444)
3. Additional extinguishers may be required to cover fire risks in relation to special hazards provided for in **E1.10**.	

E1.10 Provision for special hazards

Suitable additional provision must be made if special problems of fighting fire could arise because of—

(a) the nature or quantity of materials stored, displayed or used in a building or on the allotment; or

(b) the location of the building in relation to a water supply for fire-fighting purposes.

Tas E1.101

SPECIFICATION E1.5 FIRE SPRINKLER SYSTEMS

Deemed-to-Satisfy Provisions

1. Scope

This Specification sets out requirements for the design and installation of fire sprinkler systems.

2. Adoption of AS 2118

Subject to this Specification, a sprinkler system must comply with—

(a) AS 2118.1; or

Vic Spec E1.5 2(b)

(b) for a Class 2 or 3 building: AS 2118.4 as applicable; or

(c) for a combined sprinkler and fire hydrant system: AS 2118.6; or

(d) for a Class 9c *aged care building*: AS 2118.4, as applicable.

3. Separation of sprinklered and non-sprinklered areas

Where a part of a building is not protected with sprinklers, the sprinklered and non-sprinklered parts must be fire-separated with a wall or floor which must—

(a) comply with any specific requirement of the *Deemed-to-Satisfy Provisions* of the BCA; or

(b) where there is no specific requirement, comply with the relevant part of AS 2118.

4. Protection of openings

Any openings, including those for service penetrations, in construction separating sprinklered and non-sprinklered parts of a building, including the construction separating the areas nominated as permitted exceptions in AS 2118.1, must be protected in accordance with the *Deemed-to-Satisfy Provisions* of **Part C3**.

5. Fast response sprinklers

Fast response sprinklers may be installed only if they are suitable for the type of application proposed and it is demonstrated that the sprinkler system is designed to accommodate their use.

6. Sprinkler valve enclosures

(a) Sprinkler alarm valves must be located in a secure room or enclosure which has direct egress to a road or *open space*.

(b) All sprinkler valve rooms and enclosures must be secured with a system suitable for use by the *fire brigade*.

7. Water supply

The Grade of water supply to a *required* sprinkler system must not be less than—

(a) for a building greater than 25 m in *effective height*, Grade 1, except that a secondary water supply storage capacity of 25,000 litres may be used if—

(i) the storage tank is located at the topmost *storey* of the building; and

(ii) the building occupancy is classified as no more hazardous than Ordinary Hazard 2 (OH2) under AS 2118.1; and

(iii) an operational *fire brigade* service is available to attend a building fire; and

(b) for a building not greater than 25 m in *effective height*, at least Grade 3.

8. Building occupant warning system

A *required* sprinkler system must be connected to and activate a building occupant warning system complying with **Clause 6 of Specification E2.2a**.

9. Connection to other systems

Where a smoke hazard management system is installed and is actuated by smoke detectors, the sprinkler system must, wherever practicable, be arranged to also activate the smoke hazard management system.

10. Anti-tamper devices

Where a sprinkler system is installed in a theatre, public hall or the like, any valves provided to control sprinklers over any *stage* area must be fitted with anti-tamper devices connected to a monitoring panel at the location normally used by the *stage* manager.

11. Sprinkler systems in carparks

The sprinkler system protecting a *carpark* complying with **Table 3.9 of Specification C1.1** in a multiclassified building must—

(a) be independent of the sprinkler system protecting any part of the building not used as a *carpark*; or

(b) if forming part of a sprinkler system protecting a part of the building not used as a *carpark*, be designed such that the section protecting the non-*carpark* part can be isolated without interrupting the water supply or otherwise affecting the effective operation of the section protecting the *carpark*.

12. Class 9c aged care buildings

In addition to the provisions of AS 2118.4, a sprinkler system in a Class 9c *aged care building* must—

(a) be provided with a monitored main stop valve in accordance with AS 2118.1; and

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(b) be permanently connected with a direct data link or other approved monitoring system to a fire station or fire station dispatch centre.

SPECIFICATION E1.8 FIRE CONTROL CENTRES

Deemed-to-Satisfy Provisions

1. Scope

This Specification describes the construction and content of *required* fire control centres and rooms. A fire control room is a fire control centre in a dedicated room with additional specific requirements. **Clauses 2** to **5** apply to fire control centres (including fire control rooms). **Clauses 6** to **12** apply additional requirements to fire control rooms.

2. Purpose and content

A fire control centre must—

(a) provide an area from which fire-fighting operations or other emergency procedures can be directed or controlled; and

(b) contain controls, panels, telephones, furniture, equipment and the like associated with the *required* fire services in the building; and

(c) not be used for any purpose other than the control of—

(i) fire-fighting activities; and

(ii) other measures concerning the occupant safety or security.

3. Location of fire control centre

A fire control centre must be so located in a building that egress from any part of its floor, to a public road or *open space*, does not involve changes in level which in aggregate exceed 300 mm.

4. Equipment not permitted within a fire control centre

An internal combustion engine, pumps, sprinkler control valves, pipes and pipe fittings must not be located in a fire control centre, but may be located in rooms accessed through the fire control centre.

5. Ambient sound level for a fire control centre

(a) The ambient sound level within the fire control centre measured when all fire safety equipment is operating in the manner in which it operates in an emergency must not exceed 65 dB(A).

(b) The measurement must be taken for a sufficient time to characterize the effects of all sound sources. Where there is not a great variation in noise level, a measurement time of 60 seconds may be used.

Deemed-to-Satisfy Provisions

6. Construction of a fire control room

A fire control centre in a building more than 50 m in *effective height* must be in a separate room where—

(a) the enclosing construction is of concrete, masonry or the like, sufficiently impact resistant to withstand the impact of any likely falling debris, and with an FRL of not less than 120/120/120; and

(b) any material used as a finish, surface, lining or the like within the room complies with the requirements of **Specification C1.10**; and

(c) services, pipes, ducts and the like that are not directly *required* for the proper functioning of the fire control room do not pass through it; and

(d) openings in the walls, floors or ceiling which separate the room from the interior of the building are confined to doorways, ventilation and other openings for services necessary for the proper functioning of the facility.

7. Protection of openings in a fire control room

Openings permitted by **Clause 6** must be protected as follows:

(a) Openings for *windows*, doorways, ventilation, service pipes, conduits and the like, in an *external wall* of the building that faces a public road or *open space*, must be protected in accordance with the *Deemed-to-Satisfy Provisions* of **Part C3**.

(b) Openings in the floors, ceilings and *internal walls* enclosing a fire control room must, except for doorways, be protected in accordance with the *Deemed-to-Satisfy Provisions* of **Part C3**.

(c) A door opening in the *internal walls* enclosing a fire-control room, must be fitted with a *self closing* –/120/30 smoke sealed fire door.

(d) Openings associated with natural or mechanical ventilation must—

  (i) not be made in any ceiling or floor immediately above or below the fire control room; and

  (ii) be protected by a –/120/– fire damper if the opening is for a duct through a wall *required* to have an FRL, other than an *external wall*.

8. Doors to a fire control room

(a) *Required* doors to a fire control room must open into the room, be lockable and located so that persons using escape routes from the building will not obstruct or hinder access to the room.

(b) The fire control room must be accessible via two paths of travel—

  (i) one from the front entrance of the building; and

  (ii) one direct from a public place or *fire-isolated passageway* which leads to a public place and has a door with an FRL of not less than –/120/30.

Deemed-to-Satisfy Provisions

9. Size and contents of a fire control room

(a) A fire control room must contain—

(i) a Fire Indicator Panel and necessary control switches and visual status indication for all *required* fire pumps, smoke control fans and other *required* fire safety equipment installed in the building; and

(ii) a telephone directly connected to an external telephone exchange; and

(iii) a blackboard or whiteboard not less than 1200 mm wide x 1000 mm high; and

(iv) a pin-up board not less than 1200 mm wide x 1000 mm high; and

(v) a raked plan layout table of a size suitable for laying out the plans provided under **(vi)**; and

(vi) colour-coded, durable, tactical fire plans.

(b) In addition, a fire control room may contain—

(i) master emergency control panels, lift annunciator panels, remote switching controls for gas or electrical supplies and emergency generator backup; and

(ii) building security, surveillance and management systems if they are completely segregated from all other systems.

(c) A fire control room must—

(i) have a *floor area* of not less than 10 m^2 and the length of any internal side must be not less than 2.5 m; and

(ii) if only the minimum prescribed equipment is installed — have a net *floor area* of not less than 8 m^2 with a clear space of not less than 1.5 m^2 in front of the Fire Indicator Panel; and

(iii) if additional equipment is installed — have an additional area of not less than 2 m^2 net *floor area* for each additional facility and a clear space of not less than 1.5 m^2 in front of each additional control or indicator panel,

and the area *required* for any path of travel through the room to other areas must be provided in addition to the requirements **(ii)** and **(iii)**.

10. Ventilation and power supply for a fire control room

A fire control room must be ventilated by—

(a) natural ventilation from a *window* or doorway in an *external wall* of the building which opens directly into the fire control room from a roadway or *open space*; or

(b) a pressurisation system that only serves the fire control room, and—

(i) is installed in accordance with AS/NZS 1668.1 as though the room is a *fire-isolated stairway*; and

(ii) is activated *automatically* by operation of the fire alarm, or sprinkler system complying with **Specification E1.5**, installed in the building and manually by an over-riding control in the room; and

(iii) provides a flow of fresh air through the room of not less than 30 air changes per hour when the system is operating and any door to the room is open; and

(iv) has fans, motors and ductwork that form part of the system but not contained within the fire control room protected by enclosing construction with an FRL of not less than 120/120/120; and

(v) has any electrical supply to the fire control room or equipment necessary for its operation connected to the supply side of the main disconnection switch for the building,

and no openable devices other than necessary doorways, pressure controlled relief louvres and *windows* that are openable by a key, must be constructed in the fire control room.

11. Sign for a fire control room

The external face of the door to the fire control room must have a sign with the words—

FIRE CONTROL ROOM

in letters of not less than 50 mm high and of a colour which contrasts with that of the background.

12. Lighting for a fire control room

Emergency lighting in accordance with the *Deemed-to-Satisfy Provisions* of **Part E4** must be provided in a fire control room, except that an illumination level of not less than 400 lux must be maintained at the surface of the plan table.

PART E2 SMOKE HAZARD MANAGEMENT

OBJECTIVE

EO2

The *Objective* of this Part is to—

(a) safeguard occupants from illness or injury by warning them of a fire so that they may safely evacuate; and

(b) safeguard occupants from illness or injury while evacuating during a fire.

FUNCTIONAL STATEMENT

EF2.1

A building is to be provided with safeguards so that—

(a) occupants are warned of a fire in the building so that they may safely evacuate; and

(b) occupants have time to safely evacuate before the environment in any *evacuation route* becomes untenable from the effects of fire.

PERFORMANCE REQUIREMENTS

EP2.1

In a building providing sleeping accommodation, occupants must be provided with *automatic* warning on the detection of smoke so they may evacuate in the event of a fire to a *safe place*.

Application:

EP2.1 only applies to a Class 2, 3, 9a or 9c building or Class 4 part.

EP2.2

(a) In the event of a fire in a building the conditions in any *evacuation route* must be maintained for the period of time occupants take to evacuate the part of the building so that—

(i) the temperature will not endanger human life; and

(ii) the level of visibility will enable the *evacuation route* to be determined; and

(iii) the level of toxicity will not endanger human life.

(b) The period of time occupants take to evacuate referred to in **(a)** must be appropriate to—

(i) the number, mobility and other characteristics of the occupants; and

(ii) the function or use of the building; and

(iii) the travel distance and other characteristics of the building; and

(iv) the *fire load*; and

(v) the potential *fire intensity*; and

(vi) the *fire hazard*; and

(vii) any active *fire safety systems* installed in the building; and

(viii) *fire brigade* intervention.

Limitation:

EP2.2 does not apply to an *open-deck carpark* or *open spectator stand*.

PART E2 SMOKE HAZARD MANAGEMENT

Deemed-to-Satisfy Provisions

E2.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **EP2.1** to **EP2.2** are satisfied by complying with—

(i) **E2.1** to **E2.3**; and

(ii) in a building containing an *atrium*, **Part G3**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **E2.1** to **E2.3**; and

(ii) in a building containing an *atrium*, **Part G3**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

E2.1 Application of Part

(a) The *Deemed-to-Satisfy Provisions* of this Part do not apply to—

(i) any *open deck carpark*; or

(ii) any *open spectator stand*; or

(iii) a Class 8 *electricity network substation* with a *floor area* not more than 200 m^2, located within a multi-classified building.

(b) The smoke exhaust and *smoke-and-heat vent* provisions of this Part do not apply to any area not used by occupants for an extended period of time such as a storeroom with a floor area less than 30 m^2, *sanitary compartment*, plant room or the like.

E2.2 General requirements

(a) A building must comply with **(b)**, **(c)**, **(d)** and—

(i) **Table E2.2a** as applicable to Class 2 to 9 buildings such that each separate part complies with the relevant provisions for the classification; and

(ii) **Table E2.2b** as applicable to Class 6 and 9b buildings such that each separate part complies with the relevant provisions for the classification.

(b) An air-handling system which does not form part of a smoke hazard management system in accordance with **Table E2.2a** or **Table E2.2b** and which recycles air from one *fire compartment* to another *fire compartment* or operates in a manner that may unduly contribute to the spread of smoke from one *fire compartment* to another *fire compartment* must—

(i) be designed and installed to operate as a smoke control system in accordance with AS/NZS 1668.1; or

(ii)

(A) incorporate smoke dampers where the air-handling ducts penetrate any elements separating the *fire compartments* served; and

(B) be arranged such that the air-handling system is shut down and the smoke dampers are activated to close *automatically* by smoke detectors complying with clause 4.10 of AS/NZS 1668.1; and

for the purposes of this provision, each *sole-occupancy unit* in a Class 2 or 3 building is treated as a separate *fire compartment*.

(c) Miscellaneous air-handling systems covered by Sections 5 and 11 of AS/NZS 1668.1 serving more than one *fire compartment* (other than a *carpark* ventilation system) and not forming part of a smoke hazard management system must comply with that Section of the Standard.

(d) A smoke detection system must be installed in accordance with **Clause 5 of Specification E2.2a** to operate AS/NZS 1668.1 systems that are provided for zone smoke control and *automatic* air pressurisation for fire-isolated *exits*.

E2.3 Provision for special hazards

Additional smoke hazard management measures may be necessary due to the—

(a) special characteristics of the building; or

(b) special function or use of the building; or

(c) special type or quantity of materials stored, displayed or used in a building; or

(d) special mix of classifications within a building or *fire compartment*,

which are not addressed in **Tables E2.2a** and **E2.2b**.

NSW Table E2.2a

Table E2.2a GENERAL PROVISIONS

FIRE-ISOLATED EXITS
A *required*—
(a) *fire-isolated stairway*, including any associated *fire-isolated passageway* or *fire-isolated ramp* serving—
(i) any *storey* above an *effective height* of 25 m; or
(ii) more than 2 below ground *storeys*, not counted in the *rise in storeys* in accordance with **C1.2**; or
(iii) an *atrium*; or
(iv) a Class 9a building with a *rise in storeys* of more than 2; or
(v) a Class 9c *aged care building* with a *rise in storeys* of more than 2; and

Deemed-to-Satisfy Provisions

Table E2.2a GENERAL PROVISIONS (Continued)

(b) *fire-isolated passageway* or *fire-isolated ramp* with a length of travel more than 60 m to a road or *open space*,
must be provided with—
(c) an *automatic* air pressurisation system for fire-isolated *exits* in accordance with AS/NZS 1668.1; or
(d) open access ramps or balconies in accordance with **D2.5**.
Notes:
1. An *automatic* air pressurisation system for fire-isolated *exits* applies to the entire *exit*.
2. Refer **D1.7(d)** for pressurisation of a fire-isolated *exit* having more than 2 access doorways from within the same *storey*.
BUILDINGS MORE THAN 25 M IN EFFECTIVE HEIGHT
CLASS 2 AND 3 BUILDINGS AND CLASS 4 PART OF A BUILDING
A Class 2 and 3 building or part of a building and Class 4 part of a building must be provided with an *automatic* smoke detection and alarm system complying with **Specification E2.2a**.
Note: Refer **C2.14** for division of *public corridors* greater than 40 m in length.
CLASS 5, 6, 7b, 8 and 9b BUILDINGS
A Class 5, 6, 7b, 8 and 9b building or part of a building must be provided with a zone smoke control system in accordance with AS/NZS 1668.1
Note: Refer **Table E2.2b** for Specific Provisions applicable to a Class 6 (in a *fire compartment* having a *floor area* of more than 2000 m^2) and 9b building or part of a building.
CLASS 9a BUILDINGS
A Class 9a building must be provided with—
(a) an *automatic* smoke detection and alarm system complying with **Specification E2.2a**; and
(b) a zone smoke control system in accordance with AS/NZS 1668.1.
Note: A building more than 25 m in *effective height* requires a sprinkler system under **E1.5**.
BUILDINGS NOT MORE THAN 25 M IN EFFECTIVE HEIGHT
CLASS 2 AND 3 BUILDINGS AND CLASS 4 PART
A Class 2 and 3 building or part of a building and Class 4 part of a building—
(a) must be provided with an *automatic* smoke detection and alarm system complying with **Specification E2.2a**; and

Deemed-to-Satisfy Provisions

Table E2.2a GENERAL PROVISIONS (Continued)

(b) where a *required fire-isolated stairway* serving the Class 2 or 3 parts also serves one or more *storeys* of Class 5, 6, 7 (other than an *open deck carpark*), 8 or 9b parts—

(i) the *fire-isolated stairway*, including any associated *fire-isolated passageway* or *fire-isolated ramp*, must be provided with an *automatic* air pressurisation system for fire-isolated *exits* in accordance with AS/NZS 1668.1; or

(ii) the Class 5, 6, 7 (other than an *open deck carpark*), 8 and 9b parts must be provided with—

(A) an *automatic* smoke detection and alarm system complying with **Specification E2.2a**; or

(B) a sprinkler system complying with **Specification E1.5**; and

(c) where a *required fire-isolated stairway* serving the Class 4 part also serves one or more *storeys* of Class 5, 6, 7 (other than an *open deck carpark*), 8 or 9b parts—

(i) a system complying with (b)(i) or (b)(ii) must be installed; or

(ii) a smoke alarm or detector system complying with **Specification E2.2a** must be provided except that alarms or detectors need only be installed adjacent to each doorway into each *fire-isolated stairway* (set back horizontally from the doorway by a distance of not more than 1.5 m) to initiate a building occupant warning system for the Class 4 part.

Notes:

1. Refer **C2.14** for division of *public corridors* greater than 40 m in length.
2. Refer **Table E2.2b** for Specific Provisions applicable to a Class 6 (in a *fire compartment* having a *floor area* of more than 2000 m^2) and 9b building or part of a building.

CLASS 5, 6, 7b, 8 and 9b BUILDINGS

In a—

(a) Class 5 or 9b *school* building or part of a building having a *rise in storeys* of more than 3; or

(b) Class 6, 7b, 8 or 9b building (other than a *school*) or part of a building having a *rise in storeys* of more than 2; or

(c) building having a *rise in storeys* of more than 2 and containing—

(i) a Class 5 or 9b *school* part; and

(ii) a Class 6, 7b, 8 or 9b (other than a *school*) part,

the building must be provided with—

(d) in each *required fire-isolated stairway*, including any associated *fire-isolated passageway* or *fire-isolated ramp*, an *automatic* air pressurisation system for fire-isolated *exits* in accordance with AS/NZS 1668.1; or

(e) a zone smoke control system in accordance with AS/NZS 1668.1, if the building has more than one *fire compartment*; or

Deemed-to-Satisfy Provisions

Table E2.2a GENERAL PROVISIONS (Continued)

(f) an *automatic* smoke detection and alarm system complying with **Specification E2.2a**; or

(g) a sprinkler system complying with **Specification E1.5**.

LARGE ISOLATED BUILDINGS SUBJECT TO C2.3

(a) In a Class 7 or 8 building, which does not exceed 18 000 m^2 in *floor area* nor exceed 108 000 m^3 in volume, the building must be provided with—

(i) a sprinkler system complying with **Specification E1.5**, and provided with perimeter vehicular access complying with **C2.4(b)**; or

(ii) an *automatic* fire detection and alarm system complying with AS 1670.1 and monitored in accordance with **Clause 7 of Specification E2.2a**; or

(iii) an *automatic* smoke exhaust system in accordance with **Specification E2.2b**; or

(iv) *automatic smoke-and-heat vents* in accordance with **Specification E2.2c**; or

(v) natural smoke venting, with ventilation openings distributed as evenly as practicable and comprising permanent openings at roof level with a free area not less than 1.5% of *floor area* and low level openings which may be permanent or readily openable with a free area not less than 1.5% of *floor area*.

(b) In a Class 5 to 9 building, which exceeds 18 000 m^2 in *floor area* or 108 000 m^3 in volume, the building must be provided with—

(i) if the ceiling height of the *fire compartment* is not more than 12 m—

(A) an *automatic* smoke exhaust system in accordance with **Specification E2.2b**; or

(B) *automatic smoke-and-heat vents* in accordance with **Specification E2.2c**; or

(ii) if the ceiling height of the *fire compartment* is more than 12 m, an *automatic* smoke exhaust system in accordance with **Specification E2.2b**.

Notes:

1. Refer **Table E2.2b** for Specific Provisions applicable to a Class 6 (in a *fire compartment* having a *floor area* of more than 2000 m^2) and 9b building or part of a building.
2. Refer provisions under Class 2 and 3 buildings and Class 4 part in this Table where a Class 5, 6, 7b, 8 and 9b building contains a Class 2, 3 or 4 part.
3. Reference to "the building" being provided with specified measures, means to the nominated classes within the building. For parts of the building of other classes, see other parts of this Table.

Deemed-to-Satisfy Provisions

Table E2.2a GENERAL PROVISIONS (Continued)

CLASS 9a and 9c BUILDINGS

A Class 9a *health-care building* or a Class 9c *aged care building*, or a building containing a part thereof, must be provided throughout with—

(a) an *automatic* smoke detection and alarm system complying with **Specification E2.2a**; and

(b) *automatic* shutdown of any air-handling system which does not form part of a zone smoke control system (other than individual room units with a capacity not more than 1000 L/s, systems serving critical treatment areas and miscellaneous exhaust air systems installed in accordance with Sections 5 and 11 of AS/NZS 1668.1) on the activation of—

  (i) smoke detectors installed in accordance with (a); and

  (ii) any other installed fire detection and alarm system including a sprinkler system complying with **Specification E1.5**; and

(c) in a building having a *rise in storeys* of more than 2 and not more than 25 m *effective height* (not being a Class 9c *aged care building*)—

  (i) a zone smoke control system in accordance with AS/NZS 1668.1; or

  (ii) a sprinkler system complying with **Specification E1.5** throughout with residential sprinkler heads in *patient care areas*.

Note: Refer to **Clause 2 of Specification C2.5** for the provisions for smoke dampers.

CLASS 7a BUILDINGS

A Class 7a building, including a basement, provided with a mechanical ventilation system in accordance with AS 1668.2 must comply with clause 5.5 of AS/NZS 1668.1 except that—

(a) fans with metal blades suitable for operation at normal temperature may be used; and

(b) the electrical power and control cabling need not be fire rated.

BASEMENTS (other than Class 7a buildings)

A basement, not counted in the *rise in storeys* in accordance with **C1.2**, must—

(a) comply with measures in accordance with this Table applicable to the building generally; and

Deemed-to-Satisfy Provisions

Table E2.2a GENERAL PROVISIONS (Continued)

(b) where the basement has a total *floor area* of more than 2000 m^2, be provided with— (i) if not more than 2 below ground *storeys*— (A) a zone smoke control system in accordance with AS/NZS 1668.1, if the basement has more than one *fire compartment*; or (B) an *automatic* smoke detection and alarm system complying with **Specification E2.2a**; or (C) a sprinkler system complying with **Specification E1.5**; or (ii) if more than 2 below ground *storeys*, a sprinkler system complying with **Specification E1.5**.
Notes: 1. Refer **Table E2.2b** for Specific Provisions applicable to a Class 6 (in a *fire compartment* having a *floor area* of more than 2000 m^2) and 9b building or part of a building. 2. Basements with more than 3 below ground *storeys* or containing Class 6 or 9b occupancies with a large number of occupants may require special consideration in accordance with **E2.3**.
ATRIUMS
Refer **Part G3**.

NSW Table E2.2b

Table E2.2b SPECIFIC PROVISIONS

CLASS 6 BUILDINGS — IN FIRE COMPARTMENTS MORE THAN 2000 m^2
CLASS 6 BUILDINGS (not containing an enclosed common walkway or mall serving more than one Class 6 *sole-occupancy unit*)
(a) Where the *floor area* of a Class 6 part of a *fire compartment* is more than 2000 m^2, the *fire compartment*, must be provided with— (i) an *automatic* smoke exhaust system complying with **Specification E2.2b**; or (ii) *automatic smoke-and-heat vents* complying with **Specification E2.2c**, if the building is single *storey*; or (iii) if the *floor area* of the *fire compartment* is not more than 3500 m^2 and the building— (A) is single *storey*, an *automatic* smoke detection and alarm system complying with **Specification E2.2a**; or (B) has a *rise in storeys* of not more than 2, a sprinkler system complying with **Specification E1.5**.

Deemed-to-Satisfy Provisions

Table E2.2b SPECIFIC PROVISIONS (Continued)

(b) The provisions of (a) do not apply to—

(i) a Class 6 *sole-occupancy unit* that—

(A) has a *floor area* of not more than 2000 m^2; and

(B) is single *storey* with a main public entrance opening to a road or *open space*; and

(C) is separated from other parts of the *fire compartment* by construction, including openings, penetrations and junctions with other building elements, that prevents the free passage of smoke; and

(ii) parts of any other classification that are smoke separated from a Class 6 part by construction complying with (i)(C).

CLASS 6 BUILDINGS (containing an enclosed common walkway or mall serving more than one Class 6 *sole-occupancy unit*)

(a) Where the *floor area* of a Class 6 part of a *fire compartment* is more than 2000 m^2, the *fire compartment*, including the enclosed common walkway or mall, must be provided with—

(i) an *automatic* smoke exhaust system complying with **Specification E2.2b**; or

(ii) *automatic smoke-and-heat vents* complying with **Specification E2.2c**, if the building is single *storey*; or

(iii) if the *floor area* of the *fire compartment* is not more than 3500 m^2 and the building has a *rise in storeys* of not more than 2, a sprinkler system complying with **Specification E1.5**.

(b) The provisions of (a) do not apply to—

(i) a Class 6 *sole-occupancy unit* that—

(A) opens onto the enclosed common walkway or mall if the Class 6 *sole-occupancy unit* has a *floor area* of not more than 1000 m^2; or

(B) does not open onto the enclosed common walkway or mall if the Class 6 *sole-occupancy unit*—

(aa) has a *floor area* of not more than 2000 m^2; and

(bb) is single *storey* with a main entrance opening to a road or *open space*; and

(cc) is separated from other parts of the *fire compartment* by construction, including openings, penetrations and junctions with other building elements, that prevents the free passage of smoke; and

(ii) parts of any other classification that are smoke separated from a Class 6 part by construction complying with (i)(B)(cc).

Note: A *fire compartment* having a *floor area* of more than 3500 m^2 in a Class 6 building requires a sprinkler system under **E1.5**.

Deemed-to-Satisfy Provisions

Table E2.2b SPECIFIC PROVISIONS (Continued)

CLASS 9b — ASSEMBLY BUILDINGS
NIGHTCLUBS and DISCOTHEQUES AND THE LIKE
A building or part of a building used as a nightclub, discotheque or the like must be provided with— (a) *automatic* shutdown of any air-handling system (other than miscellaneous exhaust air systems installed in accordance with Sections 5 and 11 of AS/NZS 1668.1) which does not form part of the smoke hazard management system, on the activation of— (i) smoke detectors installed complying with **Clause 5 of Specification E2.2a**; and (ii) any other installed fire detection and alarm system, including a sprinkler system complying with **Specification E1.5**; and (b) (i) an *automatic* smoke exhaust system complying with **Specification E2.2b**; or (ii) *automatic smoke-and-heat vents* complying with **Specification E2.2c**, if the building is single *storey*; or (iii) a sprinkler system complying with **Specification E1.5** with fast response sprinkler heads.
EXHIBITION HALLS
A building or part of a building used as an exhibition hall must be provided with— (a) *automatic* shutdown of any air-handling system (other than miscellaneous exhaust air systems installed in accordance with Sections 5 and 11 of AS/NZS 1668.1) which does not form part of the smoke hazard management system, on the activation of— (i) smoke detectors installed complying with **Specification E2.2a**; and (ii) any other installed fire detection and alarm system, including a sprinkler system complying with **Specification E1.5**; and (b) where the *floor area* is more than 2000 m^2 and not more than 3500 m^2— (i) an *automatic* smoke exhaust system complying with **Specification E2.2b**; or (ii) *automatic smoke-and-heat vents* complying with **Specification E2.2c**, if the building is single *storey*; or (iii) a sprinkler system complying with **Specification E1.5**; and (c) where the *floor area* is more than 3500 m^2, a sprinkler system complying with Specification E1.5 and— (i) an *automatic* smoke exhaust system complying with **Specification E2.2b**; or (ii) *automatic smoke-and-heat vents* complying with **Specification E2.2c**, if the building is single *storey*.

Deemed-to-Satisfy Provisions

Table E2.2b SPECIFIC PROVISIONS (Continued)

THEATRES and PUBLIC HALLS
A building or part of a building used as a theatre or public hall which— (a) is a *school* assembly, church or community hall, and has a *stage* and any *backstage* area with a total *floor area* of more than 300 m^2; or (b) is not a *school* assembly, church or community hall, and has a *stage* and any *backstage* area with a total *floor area* of more than 200 m^2; or (c) has a *stage* with an associated rigging loft— must be provided with— (i) an *automatic* smoke exhaust system complying with **Specification E2.2b**; or (ii) *automatic smoke-and-heat vents* complying with **Specification E2.2c**, if the building is single *storey*.
THEATRES and PUBLIC HALLS (not listed above) INCLUDING LECTURE THEATRES AND CINEMA/AUDITORIUM COMPLEXES
A building or part of a building used as a theatre or public hall (not listed above) including a lecture theatre and cinema/auditorium complex— (a) must be provided with *automatic* shutdown of any air-handling system (other than miscellaneous exhaust air systems installed in accordance with Sections 5 and 11 of AS/NZS 1668.1) which does not form part of the smoke hazard management system, on the activation of— (i) smoke detectors installed complying with **Specification E2.2a**; and (ii) any other installed fire detection and alarm system, including a sprinkler system complying with **Specification E1.5**; and (b) other than in the case of a *school* lecture theatre, where the *floor area* of the *fire compartment* is more than 2000 m^2— (i) an *automatic* smoke exhaust system complying with **Specification E2.2b**; or (ii) *automatic smoke-and-heat vents* complying with **Specification E2.2c**, if the building is single *storey*; or (iii) if the floor area of the *fire compartment* is not more than 5000 m^2 and the building has a *rise in storeys* of not more than 2— (A) an *automatic* smoke detection and alarm system complying with **Specification E2.2a**; or (B) a sprinkler system complying with **Specification E1.5**.

Deemed-to-Satisfy Provisions

Table E2.2b SPECIFIC PROVISIONS (Continued)

OTHER ASSEMBLY BUILDINGS (not listed above) and EXCLUDING SCHOOLS
(a) Each *fire compartment*, other than one in a building described in (b), having a *floor area* of more than 2000 m^2 must be provided with—
(i) an *automatic* smoke exhaust system complying with **Specification E2.2b**; or
(ii) *automatic smoke-and-heat vents* complying with **Specification E2.2c**, if the building is single *storey*; or
(iii) if the *floor area* of the *fire compartment* is not more than 5000 m^2 and the building has a *rise in storeys* of not more than 2—
(A) an *automatic* smoke detection and alarm system complying with **Specification E2.2a**; or
(B) a sprinkler system complying with **Specification E1.5**.
(b) The following buildings are exempt from the provisions of (a):
(i) Sporting complexes (including sports halls, gymnasiums, *swimming pools*, ice and roller rinks, and the like) other than an indoor sports stadium with a total spectator seating for more than 1000.
(ii) Churches and other places used solely for religious worship.

SPECIFICATION E2.2a SMOKE DETECTION AND ALARM SYSTEMS

Deemed-to-Satisfy Provisions

1. Scope

This Specification describes the installation and operation of *automatic* smoke detection and alarm systems.

2. Type of system

A *required automatic* smoke detection and alarm system must comply with the following:

(a) **Class 2 and 3 buildings and Class 4 parts of a building**:

(i) Subject to **(ii)**, a Class 2 and 3 building and Class 4 part of a building must be provided with—

(A) a smoke alarm system complying with **Clause 3**; or

(B) a smoke detection system complying with **Clause 4**; or

(C) a combination of a smoke alarm system complying with **Clause 3** within *sole-occupancy units* and a smoke detection system complying with **Clause 4** in areas not within the *sole-occupancy units*.

(ii) A Class 3 building must be provided with a smoke detection system complying with **Clause 4** if it—

(A) has a Class 3 part located more than 2 *storeys* above ground level; or

(B) accommodates more than 20 residents and is used as a residential part of a *school* or accommodation for the aged, children or people with disabilities.

(b) **Class 5, 6, 7, 8 and 9b buildings**: A smoke detection system complying with **Clause 4**.

(c) **Class 9a health-care building**:

(i) Where 6 or less bed patients are accommodated—

(A) a smoke alarm system complying with **Clause 3**; or

(B) a smoke detection system complying with **Clause 4**.

(ii) Where more than 6 bed patients are accommodated, a smoke detection system complying with **Clause 4**.

(d) **Class 9c aged care building:** A smoke detection system complying with Clause 4.

3. Smoke alarm system

(a) A smoke alarm system must—

(i) consist of smoke alarms complying with AS 3786; and

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(ii) be powered from the consumers mains source.

(b) In kitchens and other areas where the use of the area is likely to result in smoke alarms causing spurious signals—

(i) any other alarm deemed suitable in accordance with AS 1670.1 may be installed provided that smoke alarms are installed elsewhere in the *sole-occupancy unit* in accordance with **Clause 3(c)(i)**; or

(ii) an alarm acknowledgement facility may be installed,

except where the kitchen or other area is sprinklered, the alarms need not be installed in the kitchen or other areas likely to result in spurious signals.

(c) In a Class 2 or 3 building or Class 4 part of a building, smoke alarms must be installed—

(i) within each *sole-occupancy unit*, located on or near the ceiling in any *storey*—

(A) containing bedrooms—

(aa) between each part of the *sole-occupancy unit* containing bedrooms and the remainder of the *sole-occupancy unit*; and

(bb) where bedrooms are served by a hallway, in that hallway; and

(B) not containing any bedrooms, in egress paths; and

(ii) in a building not protected with a sprinkler system, in *public corridors* and other internal public spaces, located in accordance with the requirements for smoke detectors in AS 1670.1 and connected to activate a building occupant warning system in accordance with **Clause 6**; and

(d) In a Class 9a building, smoke alarms must be installed in every room, *public corridor* and other internal public spaces and—

(i) be located in accordance with the requirements for smoke detectors in AS 1670.1 and interconnected to provide a common alarm; and

(ii) have manual call points installed in *evacuation routes* so that no point on a floor is more than 30 m from a manual call point.

4. Smoke detection system

(a) A smoke detection system must—

(i) subject to **(c)** and **(d)**, comply with AS 1670.1 except for the provisions of—

(A) Clause 3.26(f); and

(B) * * * * *

(C) * * * * *

(ii) activate a building occupant warning system in accordance with **Clause 6**.

(b) In kitchens and other areas where the use of the area is likely to result in smoke detectors causing spurious signals—

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(i) any other detector deemed suitable in accordance with AS 1670.1 may be installed provided that smoke detectors are installed elsewhere in the *sole-occupancy unit* in accordance with **Clause 3(c)(i)**; or

(ii) an alarm acknowledgement facility may be installed,

except where the kitchen or other area is sprinklered, the detectors need not be installed in the kitchen or other areas likely to result in spurious signals.

(c) In a Class 2 or 3 building or Class 4 part of a building smoke detectors must be installed—

(i) within each *sole-occupancy unit*, located in accordance with the requirements for smoke alarms in **Clause 3(c)(i)**; and

(ii) in a building not protected with a sprinkler system, in *public corridors* and other internal public spaces.

(d) In a Class 9a *health-care building*—

(i)

(A) photoelectric type smoke detectors must be installed in *patient care areas* and in paths of travel to *exits* from *patient care areas*; and

(B) in areas other than *patient care areas* and paths of travel to *exits* from *patient care areas*, where the use of the area is likely to result in smoke detectors causing spurious signals, any other detector deemed suitable in accordance with AS 1670.1 may be installed in lieu of smoke detectors, except that the detectors need not be installed if the area is sprinklered; and

(ii) manual call points must be installed in *evacuation routes* so that no point on a floor is more than 30 m from a manual call point.

Vic Spec E2.2a 4(e)

(e) In a Class 9c *aged care building*—

(i) remote automatic indication of each zone must be given in each smoke compartment by means of—

(A) mimic panels with an illuminated display; or

(B) annunciator panels with alpha numeric display; and

(ii) if the building accommodates more than 20 residents, manual call points must be installed in paths of travel so that no point on a floor is more than 30 m from a manual call point.

5. Smoke detection for smoke control systems

(a) Smoke detectors *required* to activate air pressurisation systems for fire-isolated *exits* and zone smoke control systems must—

(i) be installed in accordance with AS/NZS 1668.1; and

(ii) have additional smoke detectors installed adjacent to each bank of lift landing doors set back horizontally from the door openings by a distance of not more than 3 m.

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(b) Smoke detectors *required* to activate—

(i) *automatic* shutdown of air-handling systems in accordance with **Table E2.2b**; or

(ii) a smoke exhaust system in accordance with **Specification E2.2b**,

must—

(iii) be spaced—

(A) not more than 20 m apart and not more than 10 m from any wall, bulkhead or smoke curtain; and

(B) in enclosed malls and walkways in a Class 6 building not more than 15 m apart and not more than 7.5 m from any wall, bulkhead or curtain; and

(iv) have a sensitivity—

(A) in accordance with AS/NZS 1668.1 in areas other than a multi-*storey* walkway and mall in a Class 6 building; and

(B) not exceeding 0.5% smoke obscuration per metre with compensation for external airborne contamination as necessary, in a multi-*storey* walkway and mall in a Class 6 building.

(c) Smoke detectors provided to activate a smoke control system must—

(i)

(A) form part of a building fire or smoke detection system complying with AS 1670.1; or

(B) be a separate dedicated system incorporating control and indicating equipment complying with AS 1670.1; and

(ii) activate a building occupant warning system complying with **Clause 6**, except that smoke detectors provided solely to initiate *automatic* shutdown of air-handling systems in accordance with **(b)(i)** need not activate a building occupant warning system.

6. Building occupant warning system

Subject to **E4.9**, a building occupant warning system provided as part of a smoke hazard management system must comply with clause 3.22 of AS 1670.1 to sound through all occupied areas except—

(a) in a Class 2 and 3 building or Class 4 part of a building provided with a smoke alarm system in accordance with **Clause 3(c)(ii)**—

(i) the sound pressure level need not be measured within a *sole-occupancy unit* if a level of not less than 85 dB(A) is provided at the door providing access to the *sole-occupancy unit*; and

(ii) the inbuilt sounders of the smoke alarms may be used to wholly or partially meet the requirements; and

(b) in a Class 2 and 3 building or Class 4 part of a building provided with a smoke detection system in accordance with **Clause 4(c)**, the sound pressure level from a

warning system need not be measured within a *sole-occupancy unit* if a level of not less than 100 dB(A) is provided at the door providing access to the *sole-occupancy unit*; and

(c) in a Class 3 building used as a *residential aged care building*, the system—

(i) must be arranged to provide a warning for occupants; and

(ii) in areas used by residents, may have its alarm adjusted in volume and content to minimise trauma consistent with the type and condition of residents; and

(d) in a Class 9a *health-care building*, in a *patient care area*, the system—

(i) must be arranged to provide a warning for occupants; and

(ii) in a *ward area*, may have its alarm adjusted in volume and content to minimise trauma consistent with the type and condition of the patients.

(e) in a Class 9c *aged care building*, the system—

(i) must be arranged to provide a warning for occupants; and

(ii) must notify staff caring for the residents of the building; and

(iii) in areas used by residents, may have its alarm adjusted in volume and content to minimise trauma consistent with the type and condition of resident.

7. System monitoring

The following installations must be connected to a fire alarm monitoring system connected to a fire station or fire station dispatch centre in accordance with AS 1670.3:

(a) A smoke detection system in a Class 3 building provided in accordance with **Clause 2(a)(ii)**.

(b) A smoke detection system in a Class 9a *health-care building*, if the building accommodates more than 20 patients.

Vic Spec E2.2a 7(b)

(c) A smoke detection system in a Class 9c *aged care building*.

Vic Spec E2.2a 7(c)

(d) Smoke detection in accordance with **Clause 5** provided to activate—

(i) a smoke exhaust system in accordance with **Specification E2.2b**; or

(ii) *smoke-and-heat vents* in accordance with **Specification E2.2c**.

NSW Spec E2.2a 7(e)

(e) An *automatic* fire detection and alarm system *required* by **Table E2.2a** for large isolated buildings subject to **C2.3**.

SPECIFICATION E2.2b SMOKE EXHAUST SYSTEMS

Deemed-to-Satisfy Provisions

1. Scope

This Specification describes the requirements for mechanical smoke exhaust systems.

2. Smoke exhaust capacity

(a) Smoke exhaust fans must have a sufficient capacity to contain the smoke layer—

(i) within a smoke reservoir formed in accordance with **Clause 4** and not less than 2 m above the highest floor level; and

(ii) above the top of any openings interconnecting different smoke reservoirs.

(b) Exhaust rates must be determined in accordance with **Figure 2.1**, with the height measurement taken from the lowest floor level to the underside of the smoke layer.

3. Smoke exhaust fans

Each smoke exhaust fan, complete with its drive, flexible connections, control gear and wiring must—

(a) be constructed and installed so that it is capable of continuous operation (exhausting the *required* volumetric flow rate at the installed system resistance) at a temperature of 200° C for a period of not less than 1 hour; and

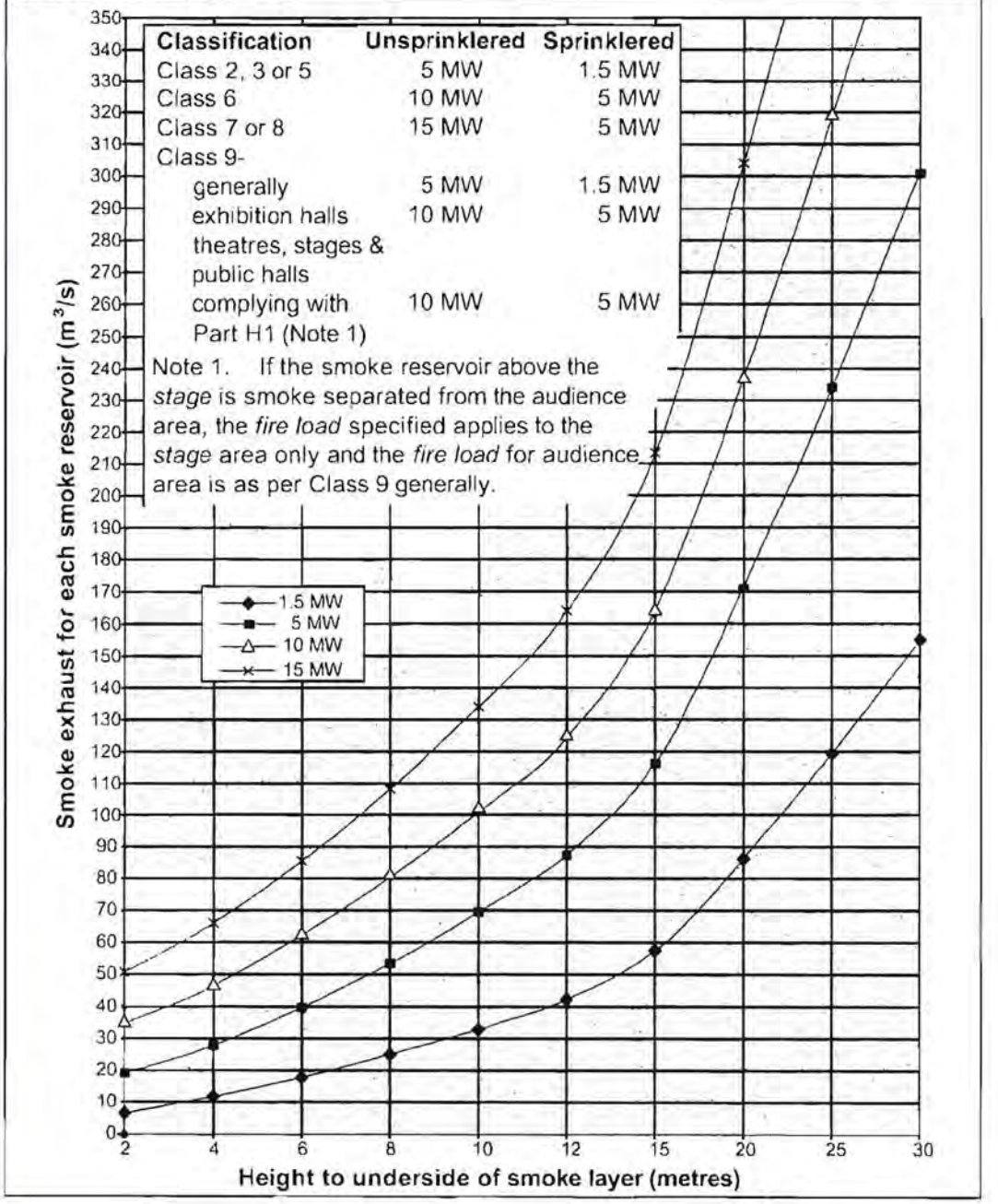
(b) in a building not fitted with a sprinkler system, be capable of continuous operation at a temperature of 300° C for a period of not less than 30 minutes; and

(c) be rated to handle the *required* volumetric flow rate at ambient temperature to be capable of exhausting cool smoke during the early stages of a fire and to allow routine testing; and

(d) have any high temperature overload devices installed, *automatically* overridden during the smoke exhaust operation.

Figure 2.1

SMOKE EXHAUST RATE



Deemed-to-Satisfy Provisions

4. Smoke reservoirs

(a) A *fire compartment* must be divided at ceiling level into smoke reservoirs formed by smoke baffles/curtains of *non-combustible* and non-shatterable construction.

(b) The horizontal area of a smoke reservoir must not exceed 2000 m^2 and in enclosed walkways and malls of a Class 6 building must not exceed 60 m in length.

(c) Smoke reservoirs must be of sufficient depth to contain the smoke layer and must not be less than 500 mm below an imperforate ceiling or roof.

(d)

(i) Within a multi-*storey fire compartment*, a *non-combustible* bulkhead or smoke baffle/curtain must be provided around the underside of each opening into a building void to minimise the spread of smoke to other *storeys*.

(ii) The depth of the bulkhead or smoke baffle must be not less than the depth of the smoke reservoir provided under (c) plus an additional 400 mm.

5. Smoke exhaust fan and vent location

Smoke exhaust fans and vents must be located—

(a) such that each smoke reservoir is served by one or more fans with the maximum exhaust rate at any one point limited to avoid extracting air from below the smoke layer; and

(b) to prevent the formation of stagnant regions resulting in excessive cooling and downward mixing of smoke: and

(c) at natural collection points for the hot smoky gases within each smoke reservoir having due regard to the ceiling geometry and its effect on the migratory path of the smoke; and

(d) away from the intersection of walkways or malls; and

(e) to ensure that any voids containing escalators and/or stairs commonly used by the public are not used as a smoke exhaust path; and

(f) to discharge directly to outdoor with a velocity of not less than 5 m/s, at a suitable point not less than 6 m from any air intake point or *exit*.

6. Make-up air

(a) Low level make-up air must be provided either *automatically* or via permanent ventilation openings to replace the air exhausted so as to minimise—

(i) any disturbance of the smoke layer due to turbulence created by the incoming air; and

(ii) the risk of smoke migration to areas remote from the fire due to the effect of make-up air on the air balance of the total system.

(b) The velocity of make-up air through doorways must not exceed 2.5 m/s.

(c) Within a multi-*storey fire compartment*, make-up air must be provided across each vertical opening from a building void to the fire-affected *storey* at an average

velocity of 1 m/s so as to minimise the spread of smoke from the fire-affected *storey* to other *storeys*.

7. Smoke exhaust system control

(a) Each smoke exhaust fan must be activated sequentially by smoke detectors complying with **Specification E2.2a** and arranged in zones to match the smoke reservoir served by the fan(s).

(b) Subject to **(c)** and **(d)**, an air handling system (other than individual room units less than 1000 l/s and miscellaneous exhaust air systems installed in accordance with Sections 5 and 11 of AS/NZS 1668.1) which does not form part of the smoke hazard management system must be *automatically* shut down on the activation of the smoke exhaust system.

(c) In a single *storey fire compartment*, air handling systems in all non fire-affected zones may operate on 100% *outdoor air* to provide make-up air to the fire-affected zone.

(d) Within a multi-*storey fire compartment*, air handling systems in all non fire-affected zones and *storeys* must operate at 100% *outdoor air* to provide make-up air to the fire-affected *storey* via building voids connecting *storeys*.

(e) Manual override control and indication together with operating instructions for use by emergency personnel must be provided adjacent to the fire indicator panel in accordance with the requirements of clauses 4.13 and 4.15 of AS/NZS 1668.1.

(f) Manual control for the smoke exhaust system must also be provided at a location normally used by the *stage* manager in a theatre.

(g) Power supply wiring to exhaust fans together with detection, control, and indication circuits (and where necessary to *automatic* make-up air supply arrangements) must comply with AS/NZS 1668.1.

8. Smoke detection

A smoke detection system must be installed in accordance with **Specification E2.2a** to activate the smoke exhaust system.

SPECIFICATION E2.2c SMOKE-AND-HEAT VENTS

Deemed-to-Satisfy Provisions

1. Adoption of AS 2665

Automatic smoke-and-heat vents must be installed as a system complying with AS 2665 except that—

(a) * * * * *

(b) * * * * *

(c) permanently open vents may form part of the smoke/heat venting system provided they comply with the relevant criteria for *automatic smoke-and-heat vents* in AS 2665.

2. Controls

Where a *smoke-and-heat vent* system is installed to comply with **Table E2.2b**, the following must apply:

(a) In addition to thermally released link operation, *smoke-and-heat vents* must also be initiated by smoke detection complying with **Clauses 5** and **7 of Specification E2.2a** and arranged in zones to match the smoke reservoirs.

(b) * * * * *

(c) * * * * *

3. * * * * *

PART E3 LIFT INSTALLATIONS

OBJECTIVE

EO3

The *Objective* of this Part is to—

(a) facilitate the safe movement of occupants; and

(b) facilitate access for emergency services personnel to carry out emergency procedures and assist in the evacuation of occupants.

FUNCTIONAL STATEMENTS

EF3.1

Where a passenger lift is provided, it is to facilitate safe and easy—

(a) movement for occupants with a disability; and

(b) evacuation of occupants, who due to illness or injury need stretcher assistance.

EF3.2

A building is to be provided with one or more passenger lifts to facilitate—

(a) the safe access for emergency services personnel; and

(b) safe and easy evacuation of occupants who due to illness, injury or disability cannot use stairways in the event of an emergency.

Application:

EF3.2 only applies to—

(a) a building with an *effective height* of more than 25 m; and

(b) a Class 9a building in which *patient care areas* are located above a level with direct access to a road or *open space*.

EF3.3

A building having a passenger lift is to be provided with measures to alert occupants when use of the lift is inappropriate.

PERFORMANCE REQUIREMENTS

EP3.1

Stretcher facilities must be provided, to the degree necessary—

(a) in at least one emergency lift *required* by **EP3.2**; or

(b) where an emergency lift is not *required* and a passenger lift is provided, in at least one lift, to serve each floor in the building served by the passenger lift.

EP3.2

One or more passenger lifts fitted as emergency lifts to serve each floor served by the lifts in a building must be installed to facilitate the activities of the *fire brigade* and other emergency services personnel.

Application:

EP3.2 only applies to—

(a) a building with an *effective height* of more than 25 m; and

(b) a Class 9a building in which *patient care areas* are located at a level that does not have direct access to a road or *open space*.

EP3.3

Signs or other means must be provided to warn occupants against the use of a lift during a fire.

EP3.4

When a passenger lift is provided in a building *required* to be *accessible*, it must be suitable for use by people with a disability.

PART E3 LIFT INSTALLATIONS

Deemed-to-Satisfy Provisions

E3.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **EP3.1** to **EP3.4** are satisfied by complying with—

(i) **E3.1** to **E3.8**; and

(ii) for public transport buildings, **Part H2**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **E3.1** to **E3.8** and **Part H2**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

E3.1 * * * * *

This clause has deliberately been left blank.

E3.2 Stretcher facility in lifts

(a) A stretcher facility in accordance with **(b)** must be provided—

(i) in at least one emergency lift *required* by **E3.4**; or

(ii) where an emergency lift is not *required*, if passenger lifts are installed to serve any storey above an *effective height* of 12 m, in at least one of those lifts to serve each floor served by the lifts.

(b) A stretcher facility must accommodate a raised stretcher with a patient lying on it horizontally by providing a clear space not less than 600 mm wide x 2000 mm long x 1400 mm high above the floor level.

E3.3 Warning against use of lifts in fire

A warning sign must—

(a) be displayed where it can be readily seen—

(i) near every call button for a passenger lift or group of lifts throughout a building; except

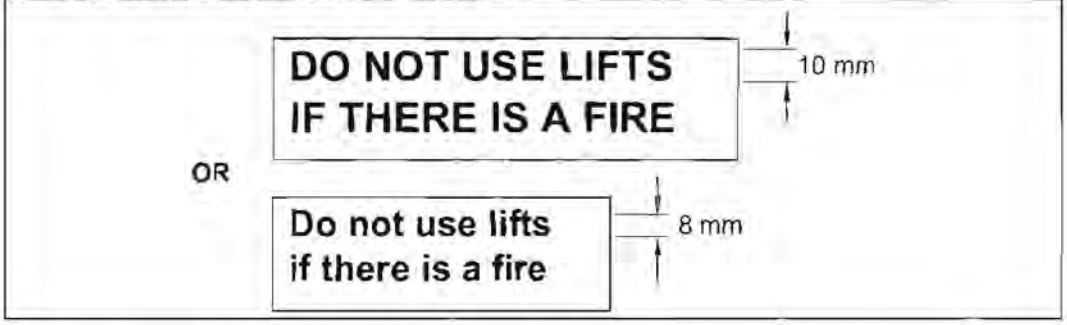
(ii) a small lift such as a dumb-waiter or the like that is for the transport of goods only; and

(b) comply with the details and dimensions of **Figure E3.3** and consist of—

(i) incised, inlaid or embossed letters on a metal, wood, plastic or similar plate securely and permanently attached to the wall; or

(ii) letters incised or inlaid directly into the surface of the material forming the wall.

Figure E3.3
WARNING SIGN FOR PASSENGER LIFTS



E3.4 Emergency lifts

(a) At least one emergency lift complying with **(e)** must be installed *in*—

(i) a building which has an *effective height* of more than 25 m; and

(ii) a Class 9a building in which *patient care areas* are located at a level that does not have direct egress to a road or *open space*.

(b) An emergency lift may be combined with a passenger lift and must serve those *storeys* served by the passenger lift so that all *storeys* of the building served by passenger lifts are served by at least one emergency lift.

(c) Where two or more passenger lifts are installed and serve the same *storeys*, excluding a lift that is within an *atrium* and not contained wholly within a *shaft*—

(i) at least two emergency lifts must be provided to serve those *storeys*; and

(ii) if located within different *shafts*, at least one emergency lift must be provided in each *shaft*.

(d) An emergency lift must be contained within a *fire-resisting shaft* in accordance with the requirements of **C2.10**.

(e) An emergency lift must—

(i) comply with AS 1735.2 or Appendix A of AS 1735.1; and

(ii) in a Class 9a building serving a *patient care area*—

(A) have minimum dimensions, measured clear of all obstructions, including handrails, etc complying with **Table E3.4**; and

(B) be connected to a standby power supply system where installed; and

(iii) have a rating of at least 600 kg if the building has an *effective height* of more than 75 m.

Deemed-to-Satisfy Provisions

Table E3.4 MINIMUM EMERGENCY LIFT DIMENSIONS IN CLASS 9a BUILDINGS

Minimum depth of car	2280 mm
Minimum width of car	1600 mm
Minimum floor to ceiling height	2300 mm
Minimum door height	2100 mm
Minimum door width	1300 mm

E3.5 Landings

(a) The provisions of clause 12.2 — "Access" of AS 1735.2 do not apply.

(b) The provisions of clause A3.2 — "Access to landings" of Appendix A of AS 1735.1 do not apply.

(c) Access and egress to and from liftwell landings must comply with the *Deemed-to-Satisfy Provisions* of **Section D**.

E3.6 Passenger lifts

In an *accessible* building, every passenger lift must—

(a) be one of the types identified in **Table E3.6a**, subject to the limitations on use specified in the Table; and

(b) have *accessible* features in accordance with **Table E3.6b**; and

(c) not rely on a constant pressure device for its operation if the lift car is fully enclosed.

Table E3.6a LIMITATIONS ON USE OF TYPES OF PASSENGER LIFTS

Lift type	Limitations on use
AS 1735.1 Appendix A	No limitation.
AS 1735.2 Electric passenger lift	No limitation.
AS 1735.3 Electrohydraulic lift	No limitation.
AS 1735.7 Stairway platform lift	Must not— (a) be used to serve a space in a building accommodating more than 100 persons calculated according to **D1.13**; or (b) be used in a high traffic public use area such as a theatre, cinema, auditorium, transport interchange, shopping centre or the like; or (c) be used where it is possible to install another type of passenger lift; or

Deemed-to-Satisfy Provisions

Table E3.6a LIMITATIONS ON USE OF TYPES OF PASSENGER LIFTS (Continued)

Lift type	Limitations on use
	(d) connect more than 2 *storeys*; or (e) where more than 1 stairway lift is installed, serve more than 2 consecutive *storeys*; or (f) when in the folded position, encroach on the minimum width of a stairway *required* by **D1.6**.
AS 1735.8 Inclined lift	No limitation.
AS 1735.14 Low-rise platform lift	Must not travel more than 1000 mm.
AS 1735.15 Lift for persons with limited mobility	Must not— (a) for an enclosed type, travel more than 4 m; or (b) for an unenclosed type, travel more than 2 m; or (c) be used in high traffic public use areas in buildings such as a theatre, cinema, auditorium, transport interchange, shopping complex or the like.
AS 1735.16 Lift for persons with limited mobility	Must not travel more than 12 m.

Deemed-to-Satisfy Provisions

Table E3.6b APPLICATION OF FEATURES TO PASSENGER LIFTS

Feature	Application
Handrail complying with the provisions for a mandatory handrail in AS 1735.12	All lifts except— (a) a stairway platform lift complying with AS 1735.7; and (b) a low-rise platform lift complying with AS 1735.14.
Lift floor dimension of not less than 1400 mm x 1600 mm	All lifts which travel more than 12 m.
Lift floor dimensions of not less than 1100 mm x 1400 mm	All lifts which travel not more than 12 m except a stairway platform lift complying with AS 1735.7.
Lift floor dimensions of not less than 810 mm x 1200 mm	A stairway platform lift complying with AS 1735.7.
Minimum clear door opening complying with AS 1735.12	All lifts except a stairway platform lift complying with AS 1735.7.
Passenger protection system complying with AS 1735.12	All lifts with a power operated door.
Lift landing doors at the upper landing	All lifts except a stairway platform lift complying with AS 1735.7.
Lift car and landing control buttons complying with AS 1735.12	All lifts except— (a) a stairway platform lift complying with AS 1735.7; and (b) a low-rise platform lift complying with AS 1735.14.
Lighting in accordance with AS 1735.12	All enclosed lift cars.
(a) Automatic audible information within the lift car to identify the level each time the car stops; and (b) audible and visual indication at each lift landing to indicate the arrival of the lift car; and (c) audible information and audible indication *required* by (a) and (b) is to be provided in a range of between 20–80 dB(A) at a maximum frequency of 1 500 Hz	All lifts serving more than 2 levels.

Deemed-to-Satisfy Provisions

Table E3.6b APPLICATION OF FEATURES TO PASSENGER LIFTS (Continued)

Feature	Application
Emergency hands-free communication, including a button that alerts a call centre of a problem and a light to signal that the call has been received	All lifts except a stairway platform lift complying with AS 1735.7.

E3.7 Fire service controls

In passenger lifts designed in accordance with AS 1735 Parts 1 or 2, all lift cars serving any storey above an *effective height* of 12 m must be provided with fire service controls.

E3.8 Aged care buildings

Where residents in a Class 9c *aged care building* are on levels which do not have direct access to a road or *open space*, the building must be provided with either,

(a) at least one lift to accommodate a stretcher in accordance with **E3.2(b)**; or

(b) a ramp in accordance with AS 1428.1, and

the lift or ramp must discharge at a level providing direct access to a road or *open space*.

PART E4 EMERGENCY LIGHTING, EXIT SIGNS AND WARNING SYSTEMS

OBJECTIVE

EO4

The *Objective* of this Part is, in an emergency, to safeguard occupants from injury by—

(a) having adequate lighting; and

(b) having adequate identification of *exits* and paths of travel to *exits*; and

(c) being made aware of the emergency.

FUNCTIONAL STATEMENT

EF4.1

A building is to be provided with—

(a) adequate lighting upon failure of normal artificial lighting during an emergency; and

(b) adequate means—

(i) of warning occupants to evacuate; and

(ii) to manage the evacuation process; and

(iii) to identify *exits* and paths of travel to an *exit*.

PERFORMANCE REQUIREMENTS

EP4.1

A level of illumination for safe evacuation in an emergency must be provided, to the degree necessary, appropriate to—

(a) the function or use of the building; and

(b) the *floor area* of the building; and

(c) the distance of travel to an *exit*.

Limitation:

EP4.1 does not apply to the internal parts of a *sole-occupancy unit* in a Class 2, 3 or 9c building or Class 4 part of a building.

EP4.2

To facilitate evacuation, suitable signs or other means of identification must, to the degree necessary—

(a) be provided to identify the location of *exits*; and

(b) guide occupants to *exits*; and

(c) be clearly visible to occupants; and

(d) operate in the event of a power failure of the main lighting system for sufficient time for occupants to safely evacuate.

Limitation:

EP4.2 does not apply to the internal parts of a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building.

EP4.3

To warn occupants of an emergency and assist evacuation of a building, a sound system and intercom system for emergency purposes must be provided, to the degree necessary, appropriate to—

(a) the *floor area* of the building; and

(b) the function or use of the building; and

(c) the height of the building.

VERIFICATION METHOD

EV4.1 Emergency Lighting

Compliance with **EP4.1** is verified for the level of illumination for safe evacuation in an emergency, when the emergency lighting system satisfies the requirements below:

(a) The calculated horizontal *illuminance* is not less than—

  (i) 0.2 lux at floor level in the path of travel to an *exit*; and

  (ii) 1 lux at each floor level or tread in every *required*—

    (A) *fire-isolated stairway*; or

    (B) *fire-isolated passageway*; or

    (C) *fire-isolated ramp*; or

(D) non-*fire-isolated stairway*; or

(E) non-*fire-isolated ramp*.

(b) The emergency lighting provides a level of *illuminance* not less than—

(i) 10% of that *required* by **(a)** within 1 second of energization; and

(ii) 80% of that *required* by **(a)** within 15 seconds of energization.

(c) The full level of illumination *required* by **(a)** must be achieved within 60 seconds of energization.

(d) An emergency lighting system must operate at not less than the minimum *required* level of *illuminance* for not less than 90 minutes.

PART E4 EMERGENCY LIGHTING, EXIT SIGNS AND WARNING SYSTEMS

Deemed-to-Satisfy Provisions

E4.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **EP4.1** to **EP4.3** are satisfied by complying with **E4.1** to **E4.9**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **E4.1** to **E4.9**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

E4.1 * * * * *

This clause has deliberately been left blank.

E4.2 Emergency lighting requirements

An emergency lighting system must be installed—

(a) in every *fire-isolated stairway*, *fire-isolated passageway* or *fire-isolated ramp*; and

(b) in every *storey* of a Class 5, 6, 7, 8 or 9 building where the *storey* has a *floor area* more than 300 m^2—

  (i) in every passageway, corridor, hallway, or the like, that is part of the path of travel to an *exit*; and

  (ii) in any room having a *floor area* more than 100 m^2 that does not open to a corridor or space that has emergency lighting or to a road or *open space*; and

  (iii) in any room having a *floor area* more than 300 m^2; and

(c) in every passageway, corridor, hallway, or the like, having a length of more than 6 m from the entrance doorway of any *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building to the nearest doorway opening directly to—

  (i) a *fire-isolated stairway*, *fire-isolated passageway* or *fire-isolated ramp*; or

  (ii) an external stairway serving instead of a *fire-isolated stairway* under **D1.8**; or

  (iii) an external balcony leading to a *fire-isolated stairway*, *fire-isolated passageway* or *fire-isolated ramp*; or

  (iv) a road or *open space*; and

(d) in every *required* non-*fire-isolated stairway*; and

(e) in a *sole-occupancy unit* in a Class 5, 6 or 9 building if—

  (i) the *floor area* of the unit is more than 300 m^2; and

(ii) an *exit* from the unit does not open to a road or *open space* or to an external stairway, passageway, balcony or ramp, leading directly to a road or *open space*; and

(f) in every room or space to which there is public access in every *storey* in a Class 6 or 9b building if—

(i) the *floor area* in that *storey* is more than 300 m^2; or

(ii) any point on the floor of that *storey* is more than 20 m from the nearest doorway leading directly to a stairway, ramp, passageway, road or *open space*; or

(iii) egress from that *storey* involves a vertical rise within the building of more than 1.5 m, or any vertical rise if the *storey* concerned does not admit sufficient light; or

(iv) the *storey* provides a path of travel from any other *storey required* by **(i)**, **(ii)** or **(iii)** to have emergency lighting; and

(g) in a Class 9a *health-care building*—

(i) in every passageway, corridor, hallway, or the like, serving a *treatment area* or a *ward area*; and

(ii) in every room having a *floor area* of more than 120 m^2 in a *patient care area*; and

(h) in every Class 9c *aged care building* excluding within *sole-occupancy units*; and

(i) in every *required* fire control centre.

E4.3 Measurement of distance

Distances, other than vertical rise, must be measured along the shortest path of travel whether by straight lines, curves or a combination of both.

E4.4 Design and operation of emergency lighting

Every *required* emergency lighting system must comply with AS 2293.1.

E4.5 Exit signs

An *exit* sign must be clearly visible to persons approaching the *exit*, and must be installed on, above or adjacent to each—

(a) door providing direct egress from a *storey* to—

(i) an enclosed stairway, passageway or ramp serving as a *required exit*; and

(ii) an external stairway, passageway or ramp serving as a *required exit*; and

(iii) an external access balcony leading to a *required exit*; and

(b) door from an enclosed stairway, passageway or ramp at every level of discharge to a road or *open space*; and

(c) *horizontal exit*; and

(d) door serving as, or forming part of, a *required exit* in a *storey required* to be provided with emergency lighting in accordance with **E4.2**.

E4.6 Direction signs

NSW E4.6

If an *exit* is not readily apparent to persons occupying or visiting the building then *exit* signs must be installed in appropriate positions in corridors, hallways, lobbies, and the like, indicating the direction to a *required exit*.

E4.7 Class 2 and 3 buildings and Class 4 parts: Exemptions

E4.5 does not apply to—

(a) a Class 2 building in which every door referred to is clearly and legibly labelled on the side remote from the *exit* or balcony—

(i) with the word "EXIT" in capital letters 25 mm high in a colour contrasting with that of the background; or

(ii) by some other suitable method; and

(b) an entrance door of a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part.

E4.8 Design and operation of exit signs

Every *required exit* sign must—

(a) comply with AS 2293.1; and

(b) be clearly visible at all times when the building is occupied by any person having the right of legal entry to the building.

E4.9 Sound systems and intercom systems for emergency purposes

A sound system and intercom system for emergency purposes complying where applicable with AS 1670.4 must be installed—

(a) in a building with an *effective height* of more than 25 m; and

(b) in a Class 3 building having a *rise in storeys* of more than 2 and used as—

(i) the residential part of a *school*; or

(ii) accommodation for the aged, children or people with a disability; and

(c) in a Class 3 building used as a *residential aged care building*, except that the system—

(i) must be arranged to provide a warning for occupants; and

(ii) in areas used by the residents, may have its alarm adjusted in volume and content to minimise trauma consistent with the type and condition of residents; and

Deemed-to-Satisfy Provisions

(d) in a Class 9a building having a *floor area* of more than 1000 m^2 or a *rise in storeys* of more than 2, and the system—

(i) must be arranged to provide a warning for occupants; and

(ii) in a *ward area*, may have its alarm adjusted in volume and content to minimise trauma consistent with the type and condition of patients; and

(e) in a Class 9b building—

(i) used as a *school* and having a *rise in storeys* of more than 3; or

(ii) used as a theatre, public hall, or the like, having a *floor area* more than 1000 m^2 or a *rise in storeys* of more than 2.

SECTION F

HEALTH AND AMENITY

SECTION F CONTENTS

PART F1 DAMP AND WEATHERPROOFING

OBJECTIVE

FO1

The *Objective* of this Part is to—

(a) safeguard occupants from illness or injury and protect the building from damage caused by—

(i) *surface water*; and

(ii) external moisture entering a building; and

(iii) the accumulation of internal moisture in a building; and

(b) protect *other property* from damage caused by redirected *surface water*.

FUNCTIONAL STATEMENTS

FF1.1

A building including any associated *sitework* is to be constructed in a way that protects people and *other property* from the adverse effects of redirected *surface water*.

FF1.2

A building is to be constructed to provide resistance to moisture penetrating from the outside including rising from the ground.

FF1.3

A building is to be constructed to avoid the likelihood of—

(a) the creation of unhealthy or dangerous conditions; and

(b) damage to building elements,

caused by dampness or water overflow from bathrooms, laundries and the like.

PERFORMANCE REQUIREMENTS

FP1.1

Surface water, resulting from a storm having an *average recurrence interval* of 20 years and which is collected or concentrated by a building or *sitework*, must be disposed of in a way that avoids the likelihood of damage or nuisance to any *other property*.

FP1.2

Surface water, resulting from a storm having an *average recurrence interval* of 100 years must not enter the building.

Limitation:

FP1.2 does not apply to—

(a) a Class 7 or 8 building where in the particular case there is no necessity for compliance; or

(b) a garage, tool shed, *sanitary compartment*, or the like, forming part of a building used for other purposes; or

(c) an *open spectator stand* or *open-deck carpark*.

FP1.3

A drainage system for the disposal of *surface water* must—

(a) convey *surface water* to an appropriate *outfall*; and

(b) avoid the entry of water into a building; and

(c) avoid water damaging the building.

FP1.4

A roof and *external wall* (including openings around *windows* and doors) must prevent the penetration of water that could cause—

(a) unhealthy or dangerous conditions, or loss of amenity for occupants; and

(b) undue dampness or deterioration of building elements.

Limitation:

FP1.4 does not apply to—

(a) a Class 7 or 8 building where in the particular case there is no necessity for compliance; or

(b) a garage, tool shed, *sanitary compartment*, or the like, forming part of a building used for other purposes; or

(c) an *open spectator stand* or *open-deck carpark*.

FP1.5

SA FP1.5

Moisture from the ground must be prevented from causing—

(a) undue dampness or deterioration of building elements; and

(b) unhealthy or dangerous conditions, or loss of amenity for occupants.

Limitation:

FP1.5 does not apply to—

(a) a Class 7 or 8 building where in the particular case there is no necessity for compliance; or

(b) a garage, tool shed, *sanitary compartment*, or the like, forming part of a building used for other purposes; or

(c) an *open spectator stand* or *open-deck carpark*.

FP1.6

SA FP1.6

Overflow from a bathroom, laundry facility or the like must be prevented from penetrating to—

(a) another *sole-occupancy unit* used for sleeping accommodation; and

(b) a public space,

in a *storey* below in the same building.

FP1.7

To protect the structure of the building and to maintain the amenity of the occupants, water must be prevented from penetrating—

(a) behind fittings and linings; and

(b) into concealed spaces,

of *sanitary compartments*, bathrooms, laundries and the like.

SA FP1.8

PART F1 DAMP AND WEATHERPROOFING

Deemed-to-Satisfy Provisions

F1.0 Deemed-to-Satisfy Provisions

(a) *Performance Requirement* **FP1.4**, for the prevention of the penetration of water through *external walls*, must be complied with.

There are no *Deemed-to-Satisfy Provisions* for this *Performance Requirement* in respect of *external walls*.

SA F1.0(b)

(b) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **FP1.1** to **FP1.3** and **FP1.5** to **FP1.7** are satisfied by complying with **F1.1** to **F1.13**.

(c) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **F1.1** to **F1.13**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

F1.1 Stormwater drainage

Stormwater drainage must comply with AS/NZS 3500.3.

F1.2 * * * * *

This clause has deliberately been left blank.

F1.3 * * * * *

This clause has deliberately been left blank.

F1.4 * * * * *

This clause has deliberately been left blank.

F1.5 Roof coverings

A roof must be covered with—

(a) concrete roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050, as appropriate; or

(b) terracotta roofing tiles complying with AS 2049 and fixed, except in cyclonic areas, in accordance with AS 2050; or

(c) cellulose cement corrugated sheeting complying with AS/NZS 2908.1 and installed in accordance with AS/NZS 1562.2; or

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(d) metal sheet roofing complying with AS 1562.1; or

(e) plastic sheet roofing designed and installed in accordance with AS/NZS 4256 Parts 1, 2, 3 and 5 and AS/NZS 1562.3; or

(f) asphalt shingles complying with ASTM D3018-90, Class A.

F1.6 Sarking

Sarking-type materials used for weatherproofing of roofs and walls must comply with AS/NZS 4200 Parts 1 and 2.

F1.7 Waterproofing of wet areas in buildings

SA F1.7

(a) In a Class 2 and 3 building and a Class 4 part of a building, building elements in *wet areas* must—

(i) be *water resistant* or *waterproof* in accordance with **Table F1.7**; and

(ii) comply with AS 3740.

(b) In a Class 5, 6, 7, 8 or 9 building, building elements in the bathroom or shower room, a slop hopper or sink compartment, a laundry or *sanitary compartment* must—

(i) be *water resistant* or *waterproof* in accordance with **Table F1.7**; and

(ii) comply with AS 3740,

as if they were in a Class 2 or 3 building or a Class 4 part of a building.

(c) Where a slab or stall type urinal is installed—

(i) the floor surface of the room containing the urinal must—

(A) be an impervious material; and

(B) where no step is installed—

(aa) be graded to the urinal channel for a distance of 1.5 m from the urinal channel; and

(bb) the remainder of the floor be graded to a floor waste; and

(C) where a step is installed—

(aa) the step must have an impervious surface and be graded to the urinal channel; and

(bb) the floor behind the step must be graded to a floor waste; and

(ii) the junction between the floor surface and the urinal channel must be impervious.

(d) Where a wall hung urinal is installed—

(i) the wall must be surfaced with impervious material extending from the floor to not less than 50 mm above the top of the urinal and not less than 225 mm on each side of the urinal.

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(ii) the floor must be surfaced with impervious material and graded to a floor waste.

(e) In a room with timber or steel framed walls and containing a urinal—

(i) the wall must be surfaced with an impervious material extending from the floor to not less than 100 mm above the floor surface; and

(ii) the junction of the floor surface and the wall surface must be impervious.

Table F1.7 WATERPROOFING AND WATER-RESISTANCE REQUIREMENTS FOR BUILDING ELEMENTS IN WET AREAS

Vessels or area where the fixture is installed	Floors and horizontal surfaces	Walls	Wall junctions and joints	Wall / floor junctions	Penetrations
Shower area (enclosed and unenclosed)					
With hob	*Waterproof* floor in *shower area* (including any hob or step-down).	(a) *Waterproof* all walls in *shower area* to a height the greater of— (i) not less than 150 mm above floor substrate; or (ii) not less than 25 mm above maximum retained water level; and (b) *Water resistant* walls in *shower area* to not less than 1800 mm above finished floor level of the shower.	*Waterproof* wall junctions within *shower area*.	*Waterproof* wall / floor junctions within *shower area*.	*Waterproof* penetrations in *shower area*.
With step-down					
Without hob or step-down					

Table F1.7 WATERPROOFING AND WATER-RESISTANCE REQUIREMENTS FOR BUILDING ELEMENTS IN WET AREAS (Continued)

Vessels or area where the fixture is installed	Floors and horizontal surfaces	Walls	Wall junctions and joints	Wall / floor junctions	Penetrations
With preformed shower base	N/A	*Water resistant* walls in *shower area* to not less than 1800 mm above finished floor level of the shower.	*Waterproof* wall junctions within *shower area*.	*Waterproof* wall / floor junctions within *shower area*.	*Waterproof* penetrations in *shower area*.
Area outside shower area					
For concrete and compressed fibre-cement sheet flooring	*Water resistant* floor of the room.	N/A	N/A	*Waterproof* wall / floor junctions.	N/A
For timber floors including particleboard, plywood and other timber based flooring materials	*Waterproof* floor of the room.				

Table F1.7 WATERPROOFING AND WATER-RESISTANCE REQUIREMENTS FOR BUILDING ELEMENTS IN WET AREAS (Continued)

Vessels or area where the fixture is installed	Floors and horizontal surfaces	Walls	Wall junctions and joints	Wall / floor junctions	Penetrations
Areas adjacent to baths and spas **Note:** Where a shower is above a bath or spa, use requirements for shower.					
For concrete and compressed fibre-cement sheet flooring	*Water resistant* floor of the room.	(a) *Water resistant* to a height of not less than 150 mm above the *vessel*, for the extent of the *vessel*, where the *vessel* is within 75 mm of a wall.	*Water resistant* junctions within 150 mm above a *vessel* for the extent of the *vessel*.	*Water resistant* wall / floor junctions for the extent of the *vessel*.	*Waterproof* tap and spout penetrations where they occur in horizontal surfaces.
For timber floors including particleboard, plywood and other timber based flooring materials	*Waterproof* floor of the room.	(b) *Water resistant* all exposed surfaces below *vessel* lip.			
Inserted baths and spas	(a) *Waterproof* shelf area, incorporating waterstop under the bath lip. (b) No requirement under bath.	(a) *Waterproof* to not less than 150 mm above lip of bath or spa; and (b) No requirement under bath.	(a) *Waterproof* junctions within 150 mm above bath or spa; and (b) No requirement under bath.	N/A	*Waterproof* tap and spout penetrations where they occur in horizontal surfaces.

Table F1.7 **WATERPROOFING AND WATER-RESISTANCE REQUIREMENTS FOR BUILDING ELEMENTS IN WET AREAS (Continued)**

Vessels or area where the fixture is installed	Floors and horizontal surfaces	Walls	Wall junctions and joints	Wall / floor junctions	Penetrations
Other areas					
Walls adjoining other *vessel* (e.g. sink, basin or laundry tub)	N/A	*Water resistant* to a height of not less than 150 mm above the *vessel*, for the extent of the *vessel*, where the *vessel* is within 75 mm of a wall.	*Waterproof* wall junctions where a *vessel* is fixed to a wall.	N/A	*Waterproof* tap and spout penetrations where they occur in surfaces *required* to be *waterproof* or *water resistant*.
Laundries and WCs	*Water resistant* floor of the room.	N/A	N/A	*Waterproof* wall / floor junctions.	*Waterproof* penetrations where they occur in surfaces *required* to be *waterproof*.
Bathrooms and laundries *required* to provide a floor waste by **F1.11**.	*Waterproof* floor of the room.	N/A	N/A	*Waterproof* wall / floor junctions.	*Waterproof* penetrations where they occur through the floor.
Note: N/A means not applicable.					

F1.8 * * * * *

This clause has deliberately been left blank.

F1.9 Damp-proofing

(a) Except for a building covered by **(c)**, moisture from the ground must be prevented from reaching—

(i) the lowest floor timbers and the walls above the lowest floor joists; and

(ii) the walls above the damp-proof course; and

(iii) the underside of a suspended floor constructed of a material other than timber, and the supporting beams or girders.

SA F1.9(b)

(b) Where a damp-proof course is provided, it must consist of—

(i) a material that complies with AS/NZS 2904; or

(ii) impervious termite shields in accordance with AS 3660.1.

(c) The following buildings need not comply with **(a)**:

(i) A Class 7 or 8 building where in the particular case there is no necessity for compliance.

(ii) A garage, tool shed, *sanitary compartment*, or the like, forming part of a building used for other purposes.

(iii) An *open spectator stand* or *open-deck carpark*.

F1.10 Damp-proofing of floors on the ground

SA F1.10

If a floor of a room is laid on the ground or on fill, moisture from the ground must be prevented from reaching the upper surface of the floor and adjacent walls by the insertion of a vapour barrier in accordance with AS 2870, except damp-proofing need not be provided if—

(a) weatherproofing is not *required*; or

(b) the floor is the base of a stair, lift or similar *shaft* which is adequately drained by gravitation or mechanical means.

F1.11 Provision of floor wastes

SA F1.11

In a Class 2 or 3 building or Class 4 part of a building, the floor of each bathroom and laundry located at any level above a *sole-occupancy unit* or public space must be graded to permit drainage to a floor waste.

F1.12 Sub-floor ventilation

The sub-floor space between a suspended floor of a building and the ground must be in accordance with the following:

(a) The sub-floor space must—

(i) be cleared of all building debris and vegetation; and

(ii) be cross-ventilated by means of openings; and

(iii) contain no dead air spaces; and

(iv) be graded to prevent surface water ponding under the building; and

(v) have evenly spaced ventilation openings.

(b) In double leaf masonry walls, the cross ventilation openings specified in **(a)** must be provided in both leaves of the masonry, with inner-leaf openings being aligned with outer-leaf openings to allow an unobstructed flow of air.

(c) Internal walls constructed in sub-floor spaces must be provided with openings—

(i) having an unobstructed area equivalent to that *required* for the adjacent external openings; and

(ii) which are evenly distributed throughout such internal walls.

(d) The clearance between the ground surface and the underside of the floor, including any horizontal framing member, must be in accordance with **Table F1.12**.

(e) The sub-floor ventilation openings in internal and *external walls* must be in accordance with **Table F1.12** for the climatic zones given in **Figure F1.12**.

(f) Where ventilation is obstructed by patios, paving or the like, additional ventilation must be provided to ensure that the overall level of ventilation is maintained.

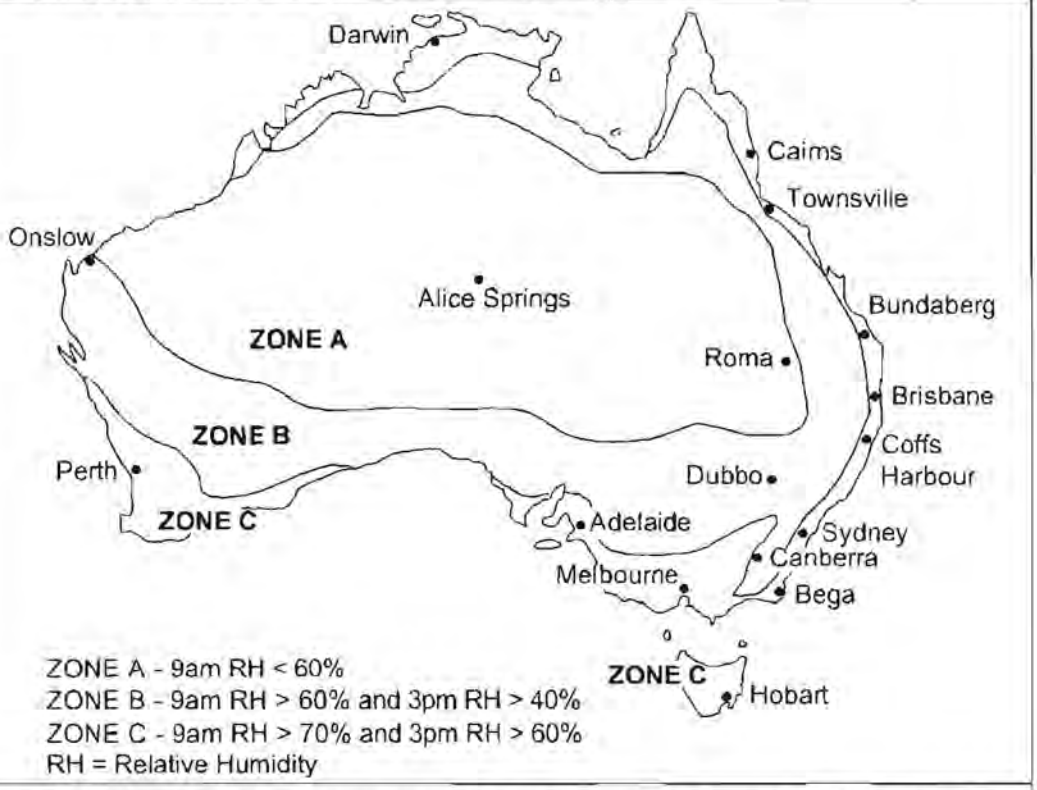
(g) Where the ground or sub-floor space is excessively damp or subject to frequent flooding, in addition to the requirements of **(a)** to **(f)**—

(i) the area of sub-floor ventilation *required* in **(e)** must be increased by 50%; or

(ii) a sealed impervious membrane must be provided over the ground; or

(iii) Durability Class 1 or 2 timbers or H3 preservative treated timbers in accordance with AS 1684.2, AS 1684.3 or AS 1684.4 must be used.

Figure F1.12
CLIMATIC ZONES BASED ON RELATIVE HUMIDITY



Note: The season with the highest relative humidity is used. Generally this will be July for southern Australia and January for northern Australia.

Table F1.12 SUB-FLOOR VENTILATION AND CLEARANCE

Climatic zone (see Figure F1.12)	Minimum sub-floor ventilation (mm^2/m of wall)		Minimum height from ground surface (mm)	
	No membrane	Ground sealed with impervious membrane	Termite inspection not required	Termite inspection required (see note)
A	2000	1000	150	400
B	4000	2000	150	400
C	6000	3000	150	400

Note: On sloping sites, 400 mm clearance may be reduced to 150 mm within 2 m of *external walls*.

F1.13 Glazed assemblies

(a) Subject to **(b)** and **(c)**, the following glazed assemblies in an *external wall*, must comply with AS 2047 requirements for resistance to water penetration:

(i) Windows.

(ii) Sliding doors with a frame.

(iii) Adjustable louvres.

(iv) Shopfronts.

(v) Window walls with one piece framing.

(b) The following buildings need not comply with **(a)**:

(i) A Class 7 or 8 building where in the particular case there is no necessity for compliance.

(ii) A garage, tool shed, *sanitary compartment*, or the like, forming part of a building used for other purposes, except where the construction of the garage, tool shed, *sanitary compartment* or the like contributes to the weatherproofing of the other part of the building.

(iii) An *open spectator stand* or *open-deck carpark*.

(c) The following glazed assemblies need not comply with **(a)**:

(i) All glazed assemblies not in an *external wall*.

(ii) Hinged doors, including French doors and bi-fold doors.

(iii) Revolving doors.

(iv) Fixed louvres.

(v) Skylights, roof lights and windows in other than the vertical plane.

(vi) Sliding doors without a frame.

(vii) Shopfront doors.

(viii) Windows constructed on site and architectural one-off windows, which are not design tested in accordance with AS 2047.

(ix) Second-hand windows, re-used windows, recycled windows and replacement windows.

(x) Heritage windows.

PART F2 SANITARY AND OTHER FACILITIES

OBJECTIVE

FO2

The *Objective* of this Part is to—

(a) safeguard occupants from illness caused by infection; and

(b) safeguard occupants from loss of amenity arising from the absence of adequate personal hygiene facilities; and

(c) enable occupants to carry out laundering; and

(d) provide for facilities to enable food preparation; and

(e) enable unconscious occupants of *sanitary compartments* to be removed from the compartment.

FUNCTIONAL STATEMENTS

FF2.1

A building is to be provided with—

(a) suitable sanitary facilities and space and facilities for personal hygiene; and

NSW FF2.1(b)

(b) adequate means for the prevention of contaminants to hot water, warm water and cooling water systems.

FF2.2

A building is to be provided with space and facilities for laundering.

Vic FF2.2 Application

Application:

FF2.2 only applies to—

(a) a Class 2 building or Class 4 part of a building; and

(b) a Class 9a *health-care building*; and

(c) a Class 9c *aged care building*; and

(d) an *early childhood centre*.

FF2.3

A building is to be provided with space and facilities for the preparation and cooking of food.

Application:

FF2.3 only applies to—

(a) a Class 2 building or Class 4 part of a building; and
(b) a Class 9a *health-care building*; and
(c) a Class 9c *aged care building*; and
(d) an *early childhood centre*.

FF2.4

A *sanitary compartment* is to have sufficient space or other means to permit an unconscious occupant to be removed from the compartment.

PERFORMANCE REQUIREMENTS

FP2.1

Suitable sanitary facilities for personal hygiene must be provided in a convenient location within or associated with a building, to the degree necessary, appropriate to—

(a) the function or use of the building; and

(b) the number and gender of the occupants; and

(c) the disability or other particular needs of the occupants.

FP2.2

Laundering facilities or space for laundering facilities must be provided in a convenient location within or associated with a building appropriate to the function or use of the building.

Vic FP2.2 Application

Application:

FP2.2 only applies to—

(a) a Class 2 building or Class 4 part; and
(b) a Class 9a *health-care building*; and
(c) a Class 9c *aged care building*; and
(d) an *early childhood centre*.

FP2.3

A facility must be provided which includes—

(a) a means for food rinsing, utensil washing and waste water disposal; and

(b) a means for cooking food; and

(c) a space for food preparation.

Application:

FP2.3 only applies to—

(a) a Class 2 building or Class 4 part; and
(b) a Class 9a *health-care building;* and
(c) a Class 9c *aged care building*; and
(d) an *early childhood centre.*

FP2.4

Suitable means must be provided in a building containing wards or bedrooms to facilitate the emptying of sewage or dirty water from containers.

Application:

FP2.4 only applies to a Class 9a or 9c building.

FP2.5

A *sanitary compartment* must be constructed with sufficient space or other means to permit an unconscious occupant to be removed from the compartment.

FP2.6

NSW FP2.6

Hot water, warm water and cooling water systems installed in a building must control the accumulation of harmful levels of micro-organisms.

Limitation:

FP2.6 does not apply to a system serving only a single *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building.

PART F2 SANITARY AND OTHER FACILITIES

Deemed-to-Satisfy Provisions

F2.0 Deemed-to-Satisfy Provisions

Vic F2.0

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **FP2.1** to **FP2.6** are satisfied by complying with—

(i) **F2.1** to **F2.8**; and

(ii) for public transport buildings, **Part H2**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **F2.1** to **F2.8** and **Part H2**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

F2.1 Facilities in residential buildings

Sanitary and other facilities for Class 2 and 3 buildings and Class 9c *aged care buildings* and for Class 4 parts of buildings must be provided in accordance with **Table F2.1**.

Table F2.1 PROVISION OF SANITARY AND OTHER FACILITIES IN RESIDENTIAL BUILDINGS

Class 2
Within each *sole-occupancy unit*, provide—
(a) a kitchen sink and facilities for the preparation and cooking of food; and
(b) a bath or shower; and
(c) a closet pan and washbasin.
Laundry facilities, provide either—
(a) in each *sole-occupancy unit*—
(i) clothes washing facilities, comprising at least one washtub and space for a washing machine; and
(ii) clothes drying facilities comprising—
(A) clothes line or hoist with not less than 7.5 m of line; or
(B) space for one heat-operated drying cabinet or appliance in the same room as the clothes washing facilities; or
Note: A kitchen sink or washbasin must not be counted as a laundry washtub.
(b) a separate laundry for each 4 *sole-occupancy units*, or part thereof—
(i) clothes washing facilities comprising at least one washtub and one washing machine; and

Deemed-to-Satisfy Provisions

Table F2.1 PROVISION OF SANITARY AND OTHER FACILITIES IN RESIDENTIAL BUILDINGS (Continued)

(ii) clothes drying facilities comprising—

(A) clothes line or hoist with not less than 7.5 m of line per *sole-occupancy unit*; or

(B) one heat-operated drying cabinet or appliance for each 4 *sole-occupancy units*.

Facilities for employees—

If the building contains more than 10 *sole-occupancy units*, or a group of Class 2 buildings on the one allotment contains, in total, more than 10 *sole-occupancy units* — provide a closet pan and washbasin in a compartment or room at or near ground level and accessible to employees without entering a *sole-occupancy unit*.

Class 3 (other than Class 3 *residential aged care buildings*)

Facilities for residents—

For each building or group of buildings, provide—

(a) a bath or shower; and

(b) a closet pan and washbasin,

for each 10 residents for whom private facilities are not provided, except that—

(c) if one urinal is provided for each 25 males up to 50 and one additional urinal for each additional 50 males or part thereof,

one closet pan for each 12 males may be provided.

Facilities for employees — see **Clause F2.3**.

Note: These facilities need not be situated within the building.

Class 3 (*residential aged care buildings*)

Facilities for residents—

For each building or group of buildings, provide—

(a) a shower, closet pan and wash basin for each 8 residents or part thereof for whom private facilities are not provided; and

(b) a suitable bath for each 30 residents or part thereof.

Note: Urinals must not be taken into consideration in calculating the number of facilities.

Class 4

For each *sole-occupancy unit*, provide—

(a) a kitchen sink and facilities for the preparation and cooking of food; and

(b) a bath or shower; and

(c) a closet pan and washbasin; and

Deemed-to-Satisfy Provisions

Table F2.1 PROVISION OF SANITARY AND OTHER FACILITIES IN RESIDENTIAL BUILDINGS (Continued)

(d) clothes washing facilities, comprising a washtub and space in the same room for a washing machine; and (e) a clothes line or hoist, or space for a heat-operated drying cabinet or similar appliance for the exclusive use of the occupants. Note: A kitchen sink or washbasin must not be counted as a laundry washtub.
Class 9c (*aged care buildings*)
Facilities for residents— For each building or group of buildings, provide— (a) a closet pan and wash basin for each 6 residents or part thereof for whom private facilities are not provided; and (b) a shower for each 7 residents or part thereof for whom private facilities are not provided; and (c) a suitable bath, fixed or mobile. Other facilities, provide— (a) one kitchen or other adequate facility for the preparation and cooking or reheating of food including a kitchen sink and washbasin; and (b) laundry facilities for the cleansing and drying of linen and clothing or adequate facilities for holding and dispatch or treatment of soiled linen and clothing and the like and the receipt and storage of clean linen; and (c) one clinical hand washing basin for each 16 residents or part thereof. Note: Urinals must not be taken into consideration in calculating the number of facilities.

F2.2 Calculation of number of occupants and facilities

(a) The number of persons accommodated must be calculated according to **D1.13** if it cannot be more accurately determined by other means.

(b) Unless the premises are used predominantly by one sex, sanitary facilities must be provided on the basis of equal numbers of males and females.

(c) In calculating the number of sanitary facilities to be provided under **F2.1** and **F2.3**, a unisex facility *required* for people with a disability may be counted once for each sex.

(d) For the purposes of this Part, a unisex facility comprises one closet pan, one washbasin and means for the disposal of sanitary towels.

Deemed-to-Satisfy Provisions

F2.3 Facilities in Class 3 to 9 buildings

(a) Sanitary facilities must be provided for Class 3, 5, 6, 7, 8 and 9 buildings in accordance with **Table F2.3**.

(b) If not more than 10 people are employed, a unisex facility may be provided instead of separate facilities for each sex.

(c) If the majority of employees are of one sex, not more than 2 employees of the other sex may share toilet facilities if the facilities are separated by means of walls, partitions and doors to afford privacy.

(d) Employees and the public may share the same facilities in a Class 6 and 9b building (other than a *school* or *early childhood centre*) provided the number of facilities provided is not less than the total number of facilities *required* for employees plus those *required* for the public.

(e) Adequate means of disposal of sanitary towels must be provided in sanitary facilities for use by females.

(f) A Class 9a *health-care building* must be provided with—

(i) one kitchen or other adequate facility for the preparation and cooking or reheating of food including a kitchen sink and washbasin; and

(ii) laundry facilities for the cleansing and drying of linen and clothing or adequate facilities for holding and dispatch or treatment of soiled linen and clothing, sanitary towels and the like and the receipt and storage of clean linen; and

(iii) one shower for each 8 patients or part thereof; and

(iv) one island-type plunge bath in each *storey* containing a *ward area*.

Vic F2.3(g) and (ga)

(g) A Class 9b *early childhood centre* must be provided with—

(i) a kitchen or food preparation area with a kitchen sink, separate hand washing facilities, space for a refrigerator and space for cooking facilities, with—

(A) the facilities protected by a door or gate with child proof latches to prevent unsupervised access to the facilities by children younger than 5 years old; and

(B) the ability to facilitate supervision of children from the facilities if the *early childhood centre* accommodates children younger than 2 years old; and

(ii) one bath, shower or shower-bath; and

(iii) if the centre accommodates children younger than 3 years old—

(A) a laundry facility comprising a washtub and space in the same room for a washing machine; and

(B) a bench type baby bath, which is within 1 m of the nappy change bench; and

Deemed-to-Satisfy Provisions

(C) a nappy changing bench which—

(aa) is within 1 m of separate adult hand washing facilities and bench type baby bath; and

(bb) must be not less than 900 mm^2 in area and at a height of not less than 850 mm, but not more than 900 mm above the finished floor level; and

(cc) must have a space not less than 800 mm high, 500 mm wide and 800 mm deep for the storage of steps; and

(dd) is positioned to permit a staff member changing a nappy to have visibility of the play area at all times.

(h) Class 9b theatres and sporting venues must be provided with one shower for each 10 participants or part thereof.

Tas Table F2.3

Vic Table F2.3

Table F2.3 SANITARY FACILITIES IN CLASS 3, 5, 6, 7, 8 AND 9 BUILDINGS

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Class 3, 5, 6 and 9 other than *schools*						
Male employees	1 — 20 > 20	1 Add 1 per 20	1 — 10 11 — 25 26 —50 >50	0 1 2 Add 1 per 50	1 — 30 > 30	1 Add 1 per 30
Female employees	1 — 15 > 15	1 Add 1 per 15			1 — 30 > 30	1 Add 1 per 30
Class 7 and 8						
Male employees	1 — 20 > 20	1 Add 1 per 20	1 — 10 11 — 25 26 —50 >50	0 1 2 Add 1 per 50	1 — 20 > 20	1 Add 1 per 20
Female employees	1 — 15 > 15	1 Add 1 per 15			1 — 20 > 20	1 Add 1 per 20
Note: Sanitary facilities need not be provided for a Class 8 *electricity network substation*						
Class 6 — department stores, shopping centres						
Male patrons	1 — 1200 > 1200	1 Add 1 per 1200	1 — 600 >600	1 Add 1 per 1200	1 — 600 >600	1 Add 1 per 1200

Table F2.3 SANITARY FACILITIES IN CLASS 3, 5, 6, 7, 8 AND 9 BUILDINGS (Continued)

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Female patrons	1 — 300 301 — 600 >600	1 2 Add 1 per 1200			1 — 600 601 — 1200 >1200	1 2 Add 1 per 1200
Note: Sanitary facilities need not be provided for patrons if the building accommodates not more than 600 people.						
Class 6 — restaurants, cafes, bars						
Male patrons	1 — 100 101 — 300 >300	1 2 Add 1 per 200	1 — 50 51 — 100 101 — 150 151 — 200 201 — 250 >250	1 2 3 4 5 Add 1 per 100	1 — 50 51 — 200 >200	1 2 Add 1 per 200
Female patrons	1 — 25 26 — 50 51 — 100 101 — 150 151 — 200 201 — 250 >250	1 2 3 4 5 6 Add 1 per 100			1 — 50 51 — 150 >150	1 2 Add 1 per 200
Note: Sanitary facilities need not be provided for patrons if the building accommodates not more than 20 people.						

Table F2.3 SANITARY FACILITIES IN CLASS 3, 5, 6, 7, 8 AND 9 BUILDINGS (Continued)

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Class 9a — *health-care buildings*						
Male patients	1 — 16 >16	2 Add 1 per 8			1 — 8 > 8	1 Add 1 per 8
Female patients	1 — 16 >16	2 Add 1 per 8			1 — 8 > 8	1 Add 1 per 8
Class 9b — *schools*						
Male employees	1 — 20 > 20	1 Add 1 per 20	1 — 10 11 — 20 21 — 45 >45	0 1 2 Add 1 per 30	1 — 30 > 30	1 Add 1 per 30
Female employees	1 — 5 >5	1 Add 1 per 15			1 — 30 > 30	1 Add 1 per 30
Male students	1 — 25 26 — 75 76 — 150 151 — 200 > 200	1 2 3 4 Add 1 per 100	1 — 50 51 — 100 >100	1 2 Add 1 per 100	1 — 10 11 — 50 51 — 100 > 100	1 2 3 Add 1 per 75

Table F2.3 SANITARY FACILITIES IN CLASS 3, 5, 6, 7, 8 AND 9 BUILDINGS (Continued)

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Female students	1 —10 11 — 25 26 — 100 > 100	1 2 Add 1 per 25 Add 1 per 50			1 — 10 11 — 50 51 — 100 > 100	1 2 3 Add 1 per 75
Class 9b — *early childhood centres*						
Children	1 — 30 > 30	2 Add 1 per 15			1 — 30 > 30	2 Add 1 per 15
Note: Facilities for use by children must be— (a) junior pans, and (b) washbasins with a rim height not exceeding 600mm, and (c) accessible from both indoor and outdoor play areas.						
Class 9b — theatres and cinemas with multiple auditoria, art galleries or the like						
Male participants	1 — 20 > 20	1 Add 1 per 20	1 — 10 > 10	1 Add 1 per 10	1 — 10 > 10	1 Add 1 per 10
Female participants	1 — 10 > 10	1 Add 1 per 10			1 — 10 > 10	1 Add 1 per 10
Male spectators or patrons	1 — 250 251 — 500 >500	1 2 Add 1 per 500	1 — 100 >100	1 Add 1 per 100	1 — 150 >150	1 Add 1 per 150

Table F2.3 SANITARY FACILITIES IN CLASS 3, 5, 6, 7, 8 AND 9 BUILDINGS (Continued)

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Female spectators or patrons	1 — 10 11 — 50 >51	1 2 Add 1 per 60			1 — 80 81 — 250 251 — 430 > 430	1 2 3 Add 1 per 200
Class 9b —single auditorium theatres and cinemas						
Male patrons	1 — 50 51 — 250 251 — 500 >500	0 1 2 Add 1 per 500	1 — 50 51 — 100 >100	0 1 Add 1 per 100	1 — 50 51 — 150 >150	0 1 Add 1 per 150
Female patrons	1 — 50 51 — 110 111 — 170 171 — 230 231 — 250 >250	0 3 4 5 6 Add 1 per 80			1 — 50 51 — 150 >150	0 1 Add 1 per 150
Class 9b — sports venues or the like						
Male participants	1 — 20 > 20	1 Add 1 per 20	1 — 10 > 10	1 Add 1 per 10	1 — 10 > 10	1 Add 1 per 10
Female participants	1 — 10 > 10	1 Add 1 per 10			1 — 10 > 10	1 Add 1 per 10

Table F2.3 SANITARY FACILITIES IN CLASS 3, 5, 6, 7, 8 AND 9 BUILDINGS (Continued)

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Male spectators or patrons	1 — 250 251 — 500 > 500	1 2 Add 1 per 500	1 — 100 > 100	1 Add 1 per 100	1 — 150 > 150	1 Add 1 per 150
Female spectators or patrons	1 — 15 16 — 60 61 — 120 > 120	1 2 3 Add 1 per 70			1 — 60 61 — 200 201 — 350 > 350	1 2 3 Add 1 per 150
Class 9b — churches, chapels or the like						
Male patrons	1 — 300 >300	1 Add 1 per 500	1 — 200 > 200	1 Add 1 per 200	1 — 250 > 250	1 Add 1 per 250
Female patrons	1 — 150 > 150	1 Add 1 per 150			1 — 250 > 250	1 Add 1 per 250
Class 9b — public halls, function rooms or the like						
Male patrons	1 — 100 >100	1 Add 1 per 200	1 — 50 51 — 100 101 — 150 151 — 200 201 — 250 >250	1 2 3 4 5 Add 1 per 100	1 — 50 51 — 200 >200	1 2 Add 1 per 200

Table F2.3 SANITARY FACILITIES IN CLASS 3, 5, 6, 7, 8 AND 9 BUILDINGS (Continued)

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Female patrons	1 — 25	1			1 — 50	1
	26 — 50	2			51 — 150	2
	51 — 100	3			>150	Add 1 per 200
	101 — 150	4				
	151 — 200	5				
	201 — 250	6				
	>250	Add 1 per 100				

Note: Sanitary facilities need not be provided for patrons if the building accommodates not more than 20 people.

Notes:

1. Number — means the number of facilities *required*.
2. > — means greater than
3. Employees — a reference to employees includes owners and managers using the building.
4. A reference to "add 1 per 100 or 150, 250, 500" etc. includes any part of that number.

F2.4 Accessible sanitary facilities

In a building *required* to be *accessible*—

SA F2.4(a)

(a) *accessible* unisex *sanitary compartments* must be provided in *accessible* parts of the building in accordance with **Table F2.4(a)**; and

SA F2.4(b)

(b) *accessible* unisex showers must be provided in accordance with **Table F2.4(b)**; and

(c) at each bank of toilets where there is one or more toilets in addition to an *accessible* unisex *sanitary compartment* at that bank of toilets, a *sanitary compartment* suitable for a person with an ambulant disability in accordance with AS 1428.1 must be provided for use by males and females; and

(d) an *accessible* unisex *sanitary compartment* must contain a closet pan, washbasin, shelf or bench top and adequate means of disposal of sanitary towels; and

(e) the circulation spaces, fixtures and fittings of all *accessible* sanitary facilities provided in accordance with **Table F2.4(a)** and **Table F2.4(b)** must comply with the requirements of AS 1428.1; and

(f) an *accessible* unisex sanitary facility must be located so that it can be entered without crossing an area reserved for one sex only; and

(g) where two or more of each type of *accessible* unisex sanitary facility are provided, the number of left and right handed mirror image facilities must be provided as evenly as possible; and

(h) where male sanitary facilities are provided at a separate location to female sanitary facilities, *accessible* unisex sanitary facilities are only *required* at one of those locations; and

(i) an *accessible* unisex *sanitary compartment* or an *accessible* unisex shower need not be provided on a *storey* or level that is not *required* by **D3.3(f)** to be provided with a passenger lift or ramp complying with AS 1428.1.

Table F2.4(a) ACCESSIBLE UNISEX SANITARY COMPARTMENTS

Class of building	Minimum accessible unisex sanitary compartments to be provided
Class 1b	(a) Not less than 1; and (b) where private *accessible* unisex *sanitary compartments* are provided for every *accessible* bedroom, common *accessible* unisex *sanitary compartments* need not be provided.
Class 2	Where *sanitary compartments* are provided in common areas, not less than 1.

Table F2.4(a) ACCESSIBLE UNISEX SANITARY COMPARTMENTS (Continued)

Class of building	Minimum accessible unisex sanitary compartments to be provided
Class 3 and Class 9c *aged care building*	(a) In every *accessible sole-occupancy unit* provided with *sanitary compartments* within the *accessible sole-occupancy unit*, not less than 1; and (b) at each bank of *sanitary compartments* containing male and female *sanitary compartments* provided in common areas, not less than 1.
Class 5, 6, 7, 8 and 9 — except for within a *ward area* of a Class 9a *health-care building*	Where **F2.3** requires closet pans— (a) 1 on every *storey* containing *sanitary compartments*; and (b) where a *storey* has more than 1 bank of *sanitary compartments* containing male and female *sanitary compartments*, at not less than 50% of those banks.
Class 10a except— (a) a Class 10a appurtenant to another Class of building; and (b) a *sanitary compartments* dedicated to a single caravan/camping site	At each bank of *sanitary compartments* containing male and female *sanitary compartments*, not less than 1.

SA Table F2.4(a)(i)

Table F2.4(b) ACCESSIBLE UNISEX SHOWERS

Class of building	Minimum accessible unisex showers to be provided
Class 1b	(a) Not less than 1; and (b) where private *accessible* unisex showers are provided for every *accessible* bedroom, common *accessible* unisex showers need not be provided.
Class 2	Where showers are provided in common areas, not less than 1
Class 3 and Class 9c *aged care building*	(a) In every *accessible sole-occupancy unit* provided with showers within the *accessible sole-occupancy unit*, not less than 1; and (b) 1 for every 10 showers or part thereof provided in common areas.

Table F2.4(b) ACCESSIBLE UNISEX SHOWERS (Continued)

Class of building	Minimum accessible unisex showers to be provided
Class 5, 6, 7, 8 and 9 — except for within a *ward area* of a Class 9a *health-care building*	Where **F2.3** requires 1 or more showers, not less than 1 for every 10 showers or part thereof.
Class 10a except— (a) a Class 10a appurtenant to another Class of building; and (b) a *sanitary compartment* dedicated to a single caravan/camping site	Where showers are provided, 1 for every 10 showers or part thereof.

SA Table F2.4(b)(i)

F2.5 Construction of sanitary compartments

(a) Other than in an *early childhood centre*, *sanitary compartments* must have doors and partitions that separate adjacent compartments and extend—

(i) from floor level to the ceiling in the case of a unisex facility; or

(ii) to a height of not less than 1.5 m above the floor if primary *school* children are the principal users; or

(iii) 1.8 m above the floor in all other cases.

(b) The door to a fully enclosed *sanitary compartment* must—

(i) open outwards; or

(ii) slide; or

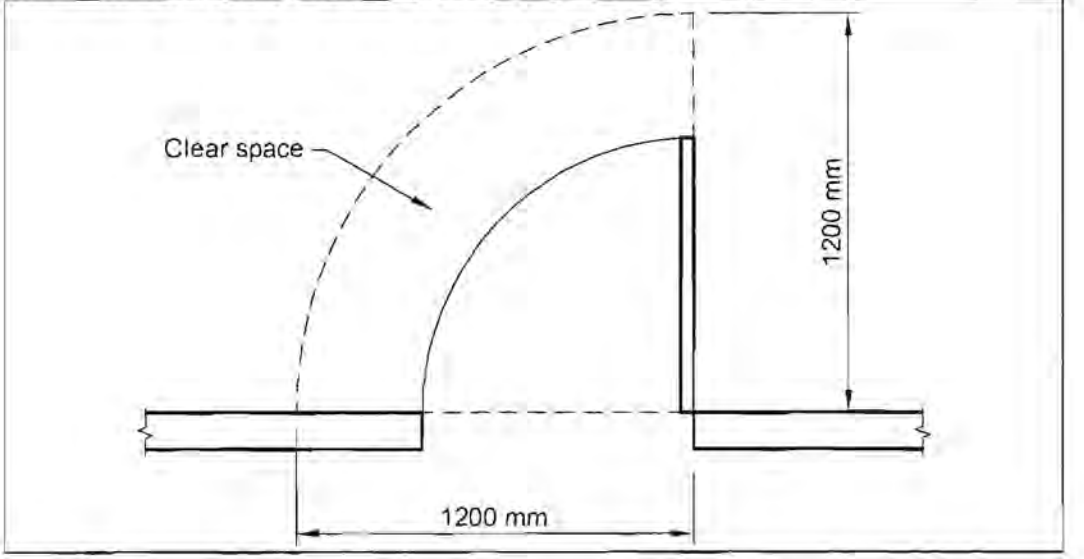
(iii) be readily removable from the outside of the *sanitary compartment*,

unless there is a clear space of at least 1.2 m, measured in accordance with **Figure F2.5**, between the closet pan within the *sanitary compartment* and the doorway.

Vic F2.5(c)

(c) In an *early childhood centre*, facilities for use by children must have each *sanitary compartment* screened by a partition which, except for the doorway, is opaque for a height of at least 900 mm but not more than 1200 mm above the floor level.

Figure F2.5
CONSTRUCTION OF SANITARY COMPARTMENTS



F2.6 Interpretation: Urinals and washbasins

(a) A urinal may be—

(i) an individual stall or wall-hung urinal; or

(ii) each 600 mm length of a continuous urinal trough; or

(iii) a closet pan used in place of a urinal.

(b) A washbasin may be—

(i) an individual basin; or

(ii) a part of a hand washing trough served by a single water tap.

F2.7 Microbial (legionella) control

NSW F2.7

Hot water, warm water and cooling water systems in a building other than a system serving only a single *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building must be installed in accordance with AS/NZS 3666.1.

F2.8 Waste management

(a) In a Class 9a *health-care building*, at least one slop-hopper or other device, other than a water closet pan or urinal, must be provided—

(i) on any *storey* containing *ward areas* or bedrooms to facilitate emptying of containers of sewage or dirty water; and

(ii) with a flushing apparatus, tap and grating.

(b) In a Class 9c *aged care building*, the following facilities must be provided for every 60 beds or part thereof on each storey containing *resident use areas*—

(i) one slop-hopper or other device other than a water closet pan or urinal for the safe handling and disposal of liquid and solid wastes with a flushing apparatus, tap and grating; and

(ii) an appliance for the disinfection of pans or an adequate means to dispose of receptacles.

Tas F2.101, F2.102

Vic F2.101

PART F3 ROOM HEIGHTS

OBJECTIVE

FO3

Vic FO3

The *Objective* of this Part is to safeguard occupants from injury or loss of amenity caused by inadequate height of a room or space.

FUNCTIONAL STATEMENT

FF3.1

Vic FF3.1

A building is to be constructed to provide height in a room or space suitable for the intended use.

PERFORMANCE REQUIREMENT

FP3.1

Vic FP3.1

A *habitable room* or space must have sufficient height that does not unduly interfere with its intended function.

PART F3 ROOM HEIGHTS

Deemed-to-Satisfy Provisions

F3.0 Deemed-to-Satisfy Provisions

Vic F3.0

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **FP3.1** is satisfied by complying with **F3.1**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **F3.1**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

F3.1 Height of rooms and other spaces

The ceiling height must be not less than—

(a) in a Class 2 or 3 building or Class 4 part—

(i) a kitchen, laundry, or the like — 2.1 m; and

(ii) a corridor, passageway or the like — 2.1 m; and

(iii) a *habitable room* excluding a kitchen — 2.4 m; and

(iv) in a room or space with a sloping ceiling or projections below the ceiling line within—

(A) a *habitable room*—

(aa) in an attic — a height of not less than 2.2 m for not less than two-thirds of the *floor area* of the room or space; and

(bb) in other rooms — a height of not less than 2.4 m for not less than two-thirds of the *floor area* of the room or space; and

(B) a non-*habitable room* — a height of not less than 2.1 m for not less than two-thirds of the *floor area* of the room or space; and

when calculating the *floor area* of a room or space, any part that has a ceiling height of less than 1.5 m is not included; and

(b) in a Class 5, 6, 7 or 8 building—

(i) except as allowed in **(ii)** and **(f)** — 2.4 m; and

(ii) a corridor, passageway, or the like — 2.1 m, and

(c) in a Class 9a *health-care building*—

(i) a *patient care area* — 2.4 m; and

(ii) an operating theatre or delivery room — 3 m; and

(iii) a treatment room, clinic, waiting room, passageway, corridor, or the like — 2.4 m; and

Deemed-to-Satisfy Provisions

(d) in a Class 9b building—

(i) a *school* classroom or other *assembly building* or part that accommodates not more than 100 persons — 2.4 m; and

(ii) a theatre, public hall or other *assembly building* or part that accommodates more than 100 persons — 2.7 m; and

(iii) a corridor—

(A) that serves an *assembly building* or part that accommodates not more than 100 persons — 2.4 m; or

(B) that serves an *assembly building* or part that accommodates more than 100 persons — 2.7 m; and

(e) in a Class 9c *aged care building*—

(i) a kitchen, laundry, or the like — 2.1 m; and

(ii) a corridor, passageway or the like — 2.4 m; and

(iii) a *habitable room* excluding a kitchen — 2.4 m; and

(f) in any building—

(i) a bathroom, shower room, *sanitary compartment*, airlock, tea preparation room, pantry, store room, garage, car parking area, or the like — 2.1 m; and

(ii) a commercial kitchen — 2.4 m; and

(iii) above a stairway, ramp, landing or the like — 2 m measured vertically above the nosing line of stairway treads or the floor surface of the ramp, landing or the like.

Vic F3.101 — F3.103

PART F4 LIGHT AND VENTILATION

OBJECTIVE

FO4

The *Objective* of this Part is to—

(a) safeguard occupants from injury, illness or loss of amenity due to—

(i) isolation from natural light; and

(ii) lack of adequate artificial lighting; and

(b) safeguard occupants from illness or loss of amenity due to lack of air freshness.

FUNCTIONAL STATEMENTS

FF4.1

A space within a building used by occupants is to be provided with openings to admit natural light consistent with its function or use.

FF4.2

A space within a building used by occupants is to be provided with artificial lighting consistent with its function or use which, when activated in the absence of suitable natural light, will enable safe movement.

FF4.3

A space used by occupants within a building is to be provided with adequate ventilation consistent with its function or use.

PERFORMANCE REQUIREMENTS

FP4.1

Sufficient openings must be provided and distributed in a building so that natural light, when available, provides a level of *illuminance* appropriate to the function or use of that part of the building.

FP4.2

Artificial lighting must be installed to provide a level of *illuminance* appropriate to the function or use of the building to enable safe movement by occupants.

FP4.3

A space in a building used by occupants must be provided with means of ventilation with *outdoor air* which will maintain adequate air quality.

FP4.4

A mechanical air-handling system installed in a building must control—

(a) the circulation of objectionable odours; and

(b) the accumulation of harmful contamination by micro-organisms, pathogens and toxins.

FP4.5

Contaminated air must be disposed of in a manner which does not unduly create a nuisance or hazard to people in the building or *other property*.

PART F4 LIGHT AND VENTILATION

Deemed-to-Satisfy Provisions

F4.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **FP4.1** to **FP4.5** are satisfied by complying with **F4.1** to **F4.12**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **F4.1** to **F4.12**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

F4.1 Provision of natural light

Natural lighting must be provided in:

(a) **Class 2 buildings and Class 4 parts of buildings** — to all *habitable rooms*.

(b) **Class 3 buildings** — to all bedrooms and dormitories.

(c) **Class 9a and 9c buildings** — to all rooms used for sleeping purposes.

Vic F4.1(d)

(d) **Class 9b buildings** — to all general purpose classrooms in primary or secondary *schools* and all playrooms or the like for the use of children in an *early childhood centre*.

F4.2 Methods and extent of natural lighting

(a) *Required* natural lighting must be provided by—

(i) *windows*, excluding *roof lights*, that—

(A) have an aggregate light transmitting area measured exclusive of framing members, glazing bars or other obstructions of not less than 10% of the *floor area* of the room; and

(B) are open to the sky or face a court or other space open to the sky or an open verandah, carport or the like; or

(ii) *roof lights*, that—

(A) have an aggregate light transmitting area measured exclusive of framing members, glazing bars or other obstructions of not less than 3% of the *floor area* of the room; and

(B) are open to the sky; or

(iii) a proportional combination of *windows* and *roof lights required* by **(i)** and **(ii)**.

Vic F4.2(b)

(b) Except in a Class 9c *aged care building*, in a Class 2, 3 or 9 building or Class 4 part of a building a *required window* that faces a boundary of an adjoining allotment

Deemed-to-Satisfy Provisions

or a wall of the same building or another building on the allotment must not be less than a horizontal distance from that boundary or wall that is the greater of—

(i) generally — 1 m; and

(ii) in a *patient care area* or other room used for sleeping purposes in a Class 9a building — 3 m; and

(iii) 50% of the square root of the exterior height of the wall in which the *window* is located, measured in metres from its sill.

Vic F4.2(c)

(c) In a Class 9c *aged care building*, a *required window* must be transparent and located—

(i) in an *external wall* with the *window* sill not more than 1 m above the floor level; and

(ii) where the *window* faces an adjoining allotment, another building or another wall of the same building, it must not be less than a horizontal distance of 3 m from the adjoining allotment, other building or wall.

(d) In a Class 9b *early childhood centre*, the sills of 50% of *windows* in children's rooms must be located not more than 500 mm above the floor level.

F4.3 Natural light borrowed from adjoining room

(a) Natural lighting to a room in a Class 2 building or Class 4 part of a building or in a *sole-occupancy unit* of a Class 3 building, may come through a glazed panel or opening from an adjoining room (including an enclosed verandah) if—

(i) both rooms are within the same *sole-occupancy unit* or the enclosed verandah is on common property; and

(ii) the glazed panel or opening has an area of not less than 10% of the *floor area* of the room to which it provides light; and

(iii) the adjoining room has—

(A) *windows*, excluding *roof lights*, that—

(aa) have an aggregate light transmitting area of not less than 10% of the combined *floor areas* of both rooms; and

(bb) are open to the sky or face a court or other space open to the sky or an open verandah, carport or the like; or

(B) *roof lights*, that—

(aa) have an aggregate light transmitting area of not less than 3% of the combined *floor areas* of both rooms; and

(bb) are open to the sky; or

(C) a proportional combination of *windows* and *roof lights required* by **(A)** and **(B)**.

(b) The areas specified in **(a)(ii)** and **(a)(iii)** may be reduced as appropriate if direct natural light is provided from another source.

F4.4 Artificial lighting

(a) Artificial lighting must be provided—

(i) in *required* stairways, passageways, and ramps; and

(ii) if natural lighting of a standard equivalent to that *required* by **F4.2** is not available, and the periods of occupation or use of the room or space will create undue hazard to occupants seeking egress in an emergency, in—

(A) Class 4 parts of a building — to *sanitary compartments*, bathrooms, shower rooms, airlocks and laundries; and

(B) Class 2 buildings — to *sanitary compartments*, bathrooms, shower rooms, airlocks, laundries, common stairways and other spaces used in common by the occupants of the building; and

(C) Class 3, 5, 6, 7, 8 and 9 buildings — to all rooms that are frequently occupied, all spaces *required* to be *accessible*, all corridors, lobbies, internal stairways, other circulation spaces and paths of egress.

(b) The artificial lighting system must comply with AS/NZS 1680.0.

(c) The system may provide a lesser level of illumination to the following spaces during times when the level of lighting would be inappropriate for the use:

(i) A theatre, cinema or the like, when performances are in progress, with the exception of aisle lighting *required* by **Part H1**.

(ii) A museum, gallery or the like, where sensitive displays require low lighting levels.

(iii) A discotheque, nightclub or the like, where to create an ambience and character for the space, low lighting levels are used.

F4.5 Ventilation of rooms

A *habitable room*, office, shop, factory, workroom, *sanitary compartment*, bathroom, shower room, laundry and any other room occupied by a person for any purpose must have—

(a) natural ventilation complying with **F4.6**; or

(b) a mechanical ventilation or air-conditioning system complying with AS 1668.2 and AS/NZS 3666.1.

NSW F4.5(b)

F4.6 Natural ventilation

(a) Natural ventilation provided in accordance with **F4.5(a)** must consist of permanent openings, *windows*, doors or other devices which can be opened—

(i) with an aggregate opening or openable size not less than 5% of the *floor area* of the room *required* to be ventilated; and

(ii) open to—

Deemed-to-Satisfy Provisions

(A) a suitably sized court, or space open to the sky; or

(B) an open verandah, carport, or the like; or

(C) an adjoining room in accordance with **F4.7**.

(b) **F4.6(a)(i)** does not apply to a Class 8 *electricity network substation*

F4.7 Ventilation borrowed from adjoining room

Natural ventilation to a room may come through a *window*, opening, ventilating door or other device from an adjoining room (including an enclosed verandah) if both rooms are within the same *sole-occupancy unit* or the enclosed verandah is common property, and—

(a) in a Class 2 building, a *sole-occupancy unit* of a Class 3 building or Class 4 part of a building—

(i) the room to be ventilated is not a *sanitary compartment*; and

(ii) the *window*, opening, door or other device has a ventilating area of not less than 5% of the *floor area* of the room to be ventilated; and

(iii) the adjoining room has a *window*, opening, door or other device with a ventilating area of not less than 5% of the combined *floor areas* of both rooms; and

(b) in a Class 5, 6, 7, 8 (except a Class 8 *electricity network substation*) or 9 building—

(i) the *window*, opening, door or other device has a ventilating area of not less than 10% of the *floor area* of the room to be ventilated, measured not more than 3.6 m above the floor; and

(ii) the adjoining room has a *window*, opening, door or other device with a ventilating area of not less than 10% of the combined *floor areas* of both rooms; and

(c) the ventilating areas specified in **(a)** and **(b)** may be reduced as appropriate if direct natural ventilation is provided from another source.

F4.8 Restriction on position of water closets and urinals

A room containing a closet pan or urinal must not open directly into—

(a) a kitchen or pantry; or

(b) a public dining room or restaurant; or

(c) a dormitory in a Class 3 building; or

(d) a room used for public assembly (which is not an *early childhood centre*, primary *school* or *open spectator stand*); or

(e) a workplace normally occupied by more than one person.

F4.9 Airlocks

If a room containing a closet pan or urinal is prohibited under **F4.8** from opening directly to another room—

(a) in a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building—

(i) access must be by an airlock, hallway or other room; or

(ii) the room containing the closet pan or urinal must be provided with mechanical exhaust ventilation; and

(b) in a Class 5, 6, 7, 8 or 9 building (which is not an *early childhood centre*, primary *school* or *open spectator stand*)—

(i) access must be by an airlock, hallway or other room with a *floor area* of not less than 1.1 m^2 and fitted with *self-closing* doors at all access doorways; or

(ii) the room containing the closet pan or urinal must be provided with mechanical exhaust ventilation and the doorway to the room adequately screened from view.

F4.10 * * * * *

This clause has deliberately been left blank. Its content covering sub-floor ventilation has been relocated to **F1.12**.

F4.11 Carparks

(a) Every *storey* of a *carpark*, except an *open-deck carpark*, must have—

(i) a system of ventilation complying with AS 1668.2; or

(ii) an adequate system of permanent natural ventilation.

(b) A mechanical ventilation system, serving a *carpark* with more than 40 vehicle spaces and controlled by an atmospheric contaminant monitoring system in accordance with AS 1668.2, may be stopped when the monitored condition is below the determined maximum concentration if—

(i) the system operates intermittently to provide a minimum of 0.5 air changes per hour (ACH) during any 24 hour period; or

(ii) a supplemental natural ventilation system equivalent to (i) is provided.

F4.12 Kitchen local exhaust ventilation

A commercial kitchen must be provided with a kitchen exhaust hood complying with AS/NZS 1668.1 and AS 1668.2 where—

(a) any cooking apparatus has—

(i) a total maximum electrical power input exceeding 8 kW; or

(ii) a total gas power input exceeding 29 MJ/h; or

(b) the total maximum power input to more than one apparatus exceeds—

(i) 0.5 kW electrical power; or

(ii) 1.8 MJ gas,

per m^2 of *floor area* of the room or enclosure.

PART F5 SOUND TRANSMISSION AND INSULATION

NT Part F5

OBJECTIVE

FO5

The *Objective* of this Part is to safeguard occupants from illness or loss of amenity as a result of undue sound being transmitted—

(a) between adjoining *sole-occupancy units*; and

(b) from common spaces to *sole-occupancy units*; and

(c) from parts of different classifications to *sole-occupancy units*.

Application:

FO5 only applies to a Class 2 or 3 building or a Class 9c *aged care building*.

FUNCTIONAL STATEMENT

FF5.1

A part of a building that separates *sole-occupancy units*, or separates a *sole-occupancy unit* from a common space or part of another classification within the building is to be constructed to prevent undue sound transmission.

Application:

FF5.1 only applies to a Class 2 or 3 building or a Class 9c *aged care building*.

PERFORMANCE REQUIREMENTS

FP5.1

Floors separating—

(a) *sole-occupancy units*; or

(b) a *sole-occupancy unit* from a plant room, lift *shaft*, stairway, *public corridor*, public lobby, or the like, or a part of a different classification,

must provide insulation against the transmission of airborne and impact generated sound sufficient to prevent illness or loss of amenity to the occupants.

Application:

FP5.1 only applies to a Class 2 or 3 building.

FP5.2

Walls separating *sole-occupancy units* or a *sole-occupancy unit* from a plant room, lift *shaft*, stairway, *public corridor*, public lobby, or the like, or parts of a different classification, must provide insulation against the transmission of—

(a) airborne sound; and

(b) impact generated sound, if the wall is separating a bathroom, *sanitary compartment*, laundry or kitchen in one *sole-occupancy unit* from a *habitable room* (other than a kitchen) in an adjoining unit,

sufficient to prevent illness or loss of amenity to the occupants.

Application:

FP5.2 only applies to a Class 2 or 3 building.

FP5.3

The *required* sound insulation of a floor or a wall must not be compromised by—

(a) the incorporation or penetration of a pipe or other service element; or

(b) a door assembly.

Application

FP5.3 only applies to a Class 2 or 3 building.

FP5.4

Floors separating *sole-occupancy units* must provide insulation against the transmission of airborne and impact generated sound sufficient to prevent illness or loss of amenity to the occupants.

Application

FP5.4 only applies to a Class 9c *aged care building*.

FP5.5

Walls separating *sole-occupancy units*, or a *sole-occupancy unit* from a kitchen, bathroom, *sanitary compartment* (not being an associated ensuite), laundry, plant room or utilities room, must provide insulation against the transmission of—

(a) airborne sound; and

(b) impact generated sound, if the wall separates a *sole-occupancy unit* from a kitchen or laundry,

sufficient to prevent illness or loss of amenity to the occupants.

Application

FP5.5 only applies to a Class 9c *aged care building*.

FP5.6

The required sound insulation of a floor or a wall must not be compromised by the incorporation or penetration of a pipe or other service element.

Application

FP5.6 only applies to a Class 9c *aged care building*.

VERIFICATION METHODS

FV5.1

Compliance with **FP5.1** and **FP5.3** to avoid the transmission of airborne and impact generated sound through floors is verified when it is measured in-situ that the separating floor has—

(a) airborne: a weighted standardised level difference with spectrum adaptation term ($D_{nT,w} + C_{tr}$) not less than 45 when determined under AS/NZS 1276.1 or ISO 717.1; and

(b) impact: a weighted standardised impact sound pressure level with spectrum adaptation term ($L_{nT,w} + C_I$) not more than 62 when determined under AS/ISO 717.2.

FV5.2

Compliance with **FP5.2(a)** and **FP5.3** to avoid the transmission of airborne sound through walls is verified when it is measured in-situ that—

(a) a wall separating *sole-occupancy units* has a weighted standardised level difference with spectrum adaptation term ($D_{nT,w} + C_{tr}$) not less than 45 when determined under AS/NZS 1276.1 or ISO 717.1; or

(b) a wall separating a *sole-occupancy unit* from a plant room, lift *shaft*, stairway, *public corridor*, public lobby, or the like, or parts of a different classification, has a weighted standardised level difference ($D_{nT,w}$) not less than 45 when determined under AS/NZS 1276.1 or ISO 717.1; or

(c) any door assembly located in a wall that separates a *sole-occupancy unit* from a stairway, public corridor, public lobby, or the like, has a weighted standardised level

difference ($D_{nT,w}$) not less than 25 when determined under AS/NZS 1276.1 or ISO 717.1.

PART F5 SOUND TRANSMISSION AND INSULATION

Deemed-to-Satisfy Provisions

NT Part F5

F5.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **FP5.1** to **FP5.6** are satisfied by complying with **F5.1** to **F5.7**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **F5.1** to **F5.7**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

F5.1 Application of Part

The *Deemed-to-Satisfy Provisions* of this Part apply to Class 2 and 3 buildings and Class 9c *aged care buildings*.

F5.2 Determination of airborne sound insulation ratings

A form of construction *required* to have an airborne sound insulation rating must—

(a) have the *required* value for weighted sound reduction index (R_w) or weighted sound reduction index with spectrum adaptation term ($R_w + C_{tr}$) determined in accordance with AS/NZS 1276.1 or ISO 717.1 using results from laboratory measurements; or

(b) comply with **Specification F5.2**.

F5.3 Determination of impact sound insulation ratings

(a) A floor in a building *required* to have an impact sound insulation rating must—

  (i) have the *required* value for weighted normalised impact sound pressure level with spectrum adaptation term ($L_{n\,w} + C_I$) determined in accordance with AS/ISO 717.2 using results from laboratory measurements; or

  (ii) comply with **Specification F5.2**.

(b) A wall in a building required to have an impact sound insulation rating must—

  (i) for a Class 2 or 3 building be of discontinuous construction; and

  (ii) for a Class 9c *aged care building*, must—

    (A) for other than masonry, be two or more separate leaves without rigid mechanical connection except at the periphery; or

    (B) be identical with a prototype that is no less resistant to the transmission of impact sound when tested in accordance with **Specification F5.5** than a wall listed in Table 2 of **Specification F5.2**.

(c) For the purposes of this Part, discontinuous construction means a wall having a minimum 20 mm cavity between 2 separate leaves, and

(i) for masonry, where wall ties are required to connect leaves, the ties are of the resilient type; and

(ii) for other than masonry, there is no mechanical linkage between leaves except at the periphery.

F5.4 Sound insulation rating of floors

(a) A floor in a Class 2 or 3 building must have an $R_w + C_{tr}$ (airborne) not less than 50 and an $L_{n,w} + C_I$ (impact) not more than 62 if it separates—

(i) *sole-occupancy units*; or

(ii) a *sole-occupancy unit* from a plant room, lift *shaft*, stairway, *public corridor*, public lobby or the like, or parts of a different classification.

(b) A floor in a Class 9c *aged care building* separating *sole-occupancy units* must have an R_w not less than 45.

F5.5 Sound insulation rating of walls

(a) A wall in a Class 2 or 3 building must—

(i) have an $R_w + C_{tr}$ (airborne) not less than 50, if it separates *sole-occupancy units*; and

(ii) have an R_w (airborne) not less than 50, if it separates a *sole-occupancy unit* from a plant room, lift *shaft*, stairway, *public corridor*, public lobby or the like, or parts of a different classification; and

(iii) comply with **F5.3(b)** if it separates—

(A) a bathroom, *sanitary compartment*, laundry or kitchen in one *sole-occupancy unit* from a *habitable room* (other than a kitchen) in an adjoining unit; or

(B) a *sole-occupancy unit* from a plant room or lift *shaft*.

(b) A door may be incorporated in a wall in a Class 2 or 3 building that separates a *sole-occupancy unit* from a stairway, *public corridor*, public lobby or the like, provided the door assembly has an R_w not less than 30.

(c) A wall in a Class 9c *aged care building* must have an R_w not less than 45 if it separates—

(i) *sole-occupancy units*; or

(ii) a *sole-occupancy unit* from a kitchen, bathroom, *sanitary compartment* (not being an associated ensuite), laundry, plant room or utilities room.

(d) In addition to (c), a wall separating a *sole-occupancy unit* in a Class 9c *aged care building* from a kitchen or laundry must comply with **F5.3(b)**.

(e) Where a wall *required* to have sound insulation has a floor above, the wall must continue to—

(i) the underside of the floor above; or

(ii) a ceiling that provides the sound insulation *required* for the wall.

(f) Where a wall *required* to have sound insulation has a roof above, the wall must continue to—

(i) the underside of the roof above; or

(ii) a ceiling that provides the sound insulation *required* for the wall.

F5.6 Sound insulation rating of services

(a) If a duct, soil, waste or water supply pipe, including a duct or pipe that is located in a wall or floor cavity, serves or passes through more than one *sole-occupancy unit*, the duct or pipe must be separated from the rooms of any *sole-occupancy unit* by construction with an $R_w + C_{tr}$ (airborne) not less than—

(i) 40 if the adjacent room is a *habitable room* (other than a kitchen); or

(ii) 25 if the adjacent room is a kitchen or non-*habitable room*.

(b) If a storm water pipe passes through a *sole-occupancy unit* it must be separated in accordance with **(a)(*i*)** and **(ii)**.

F5.7 Sound isolation of pumps

A flexible coupling must be used at the point of connection between the service pipes in a building and any circulating or other pump.

SPECIFICATION F5.2 SOUND INSULATION FOR BUILDING ELEMENTS

Deemed-to-Satisfy Provisions

1. Scope

(a) This Specification lists the weighted sound reduction index R_w for some common forms of construction.

(b) Wall systems listed in Table 2 having a minimum 20 mm cavity between 2 separate leaves, with

(i) for masonry, where wall ties are required to connect leaves, the ties are of the resilient type; and

(ii) for other than masonry, there is no mechanical linkage between leaves except at the periphery,

are deemed to be discontinuous construction.

2. Construction Deemed-to-Satisfy

The forms of construction listed in **Table 2** for wall construction and **Table 3** for floor construction, are considered to have the R_w, $R_w + C_{tr}$ and $L_{n,w} + C_l$ stated in that Table. The forms of construction must be installed as follows:

(a) **Masonry** — Units must be laid with all joints filled solid, including those between the masonry and any adjoining construction.

(b) **Concrete slabs** — Joints between concrete slabs or panels and any adjoining construction must be filled solid.

(c) **Sheeting materials**—

(i) if one layer is *required* on both sides of a wall, it must be fastened to the studs with joints staggered on opposite sides; and

(ii) if two layers are *required*, the second layer must be fastened over the first layer so that the joints do not coincide with those of the first layer; and

(iii) joints between sheets or between sheets and any adjoining construction must be taped and filled solid.

(d) **Timber or steel-framed construction** — perimeter framing members must be securely fixed to the adjoining structure and—

(i) bedded in resilient compound; or

(ii) the joints must be caulked so that there are no voids between the framing members and the adjoining structure.

(e) **Services**—

(i) Services must not be chased into concrete or masonry elements.

Deemed-to-Satisfy Provisions

(ii) A door or panel *required* to have a certain $R_w + C_{tr}$ that provides access to a duct, pipe or other service must—

(A) not open into any *habitable room* (other than a kitchen); and

(B) be firmly fixed so as to overlap the frame or rebate of the frame by not less than 10 mm, be fitted with a sealing gasket along all edges and be constructed of—

(aa) wood, particleboard or blockboard not less than 33 mm thick; or

(bb) compressed fibre reinforced cement sheeting not less than 9 mm thick; or

(cc) other suitable material with a mass per unit area not less than 24.4 kg/m^2.

(iii) A water supply pipe must—

(A) only be installed in the cavity of discontinuous construction; and

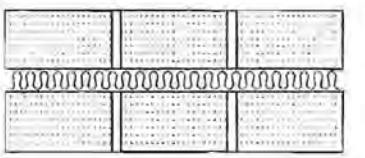
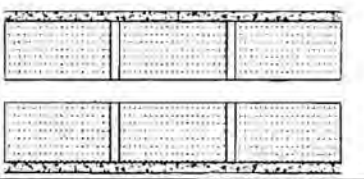
(B) in the case of a pipe that serves only one *sole-occupancy unit*, not be fixed to the wall leaf on the side adjoining any other *sole-occupancy unit* and have a clearance not less than 10 mm to the other wall leaf.

(iv) Electrical outlets must be offset from each other—

(A) in masonry walling, not less than 100 mm; and

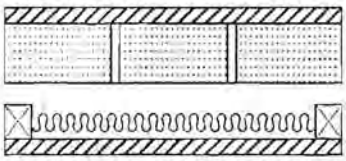
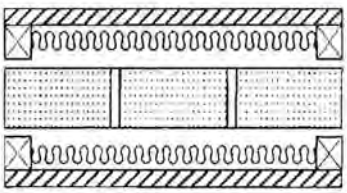
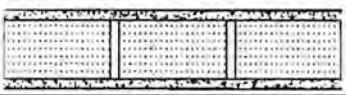
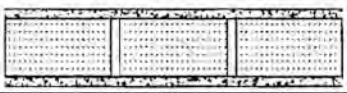
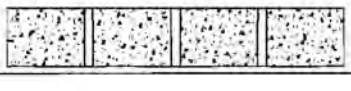
(B) in timber or steel framed walling, not less than 300 mm.

Table 2 ACCEPTABLE FORMS OF CONSTRUCTION FOR WALLS

Description	$R_w + C_{tr}$ (not less than)	R_w (not less than)	Construction
Wall construction type: Masonry			
Two leaves of 110 mm clay brick masonry with— (a) cavity not less than 50 mm between leaves; and (b) 50 mm thick glass wool insulation with a density of 11 kg/m^3 or 50 mm thick polyester insulation with a density of 20 kg/m^3 in the cavity.	50	50	
Two leaves of 110 mm clay brick masonry with— (a) cavity not less than 50 mm between leaves; and (b) 13 mm cement render on each outside face.	50	50	

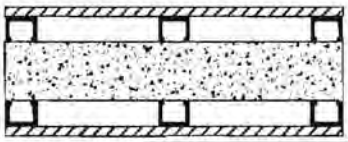
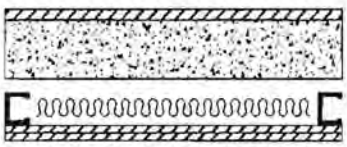
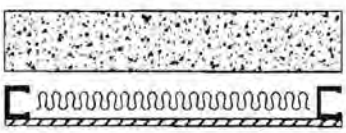
Deemed-to-Satisfy Provisions

Table 2 ACCEPTABLE FORMS OF CONSTRUCTION FOR WALLS (Continued)

Description	$R_w + C_{tr}$ (not less than)	R_w (not less than)	Construction
Single leaf of 110 mm clay brick masonry with— (a) a row of 70 mm×35 mm timber studs or 64 mm steel studs at 600 mm centres, spaced 20 mm from the masonry wall; and (b) 50 mm thick mineral insulation or glass wool insulation with a density of 11 kg/m^3 positioned between studs; and (c) one layer of 13 mm plasterboard fixed to outside face of studs and outside face of masonry.	50	50	
Single leaf of 90 mm clay brick masonry with— (a) a row of 70 mm×35 mm timber studs or 64 mm steels studs at 600 mm centres, spaced 20 mm from each face of the masonry wall; and (b) 50 mm thick mineral insulation or glass wool insulation with a density of 11 kg/m^3 positioned between studs in each row; and (c) one layer of 13 mm plasterboard fixed to studs on each outside face.	50	50	
Single leaf of 150 mm brick masonry with 13 mm cement render on each face.	-	50	
Single leaf of 220 mm brick masonry with 13 mm cement render on each face.	50	50	
110 mm thick brick masonry with 13 mm cement render on each face.	-	45	
110 mm thick concrete brickwork.	-	45	

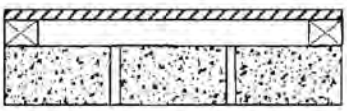
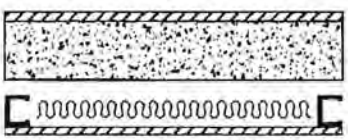
Deemed-to-Satisfy Provisions

Table 2 ACCEPTABLE FORMS OF CONSTRUCTION FOR WALLS (Continued)

Description	$R_w + C_{tr}$ (not less than)	R_w (not less than)	Construction
Wall construction type: Concrete			
150 mm thick concrete panel.	50	50	
150 mm thick concrete panel with one layer of 10 mm plasterboard fixed to 28 mm metal furring channels on each face.	-	50	
200 mm thick concrete panel with one layer of 13 mm plasterboard or 13 mm cement render on each face.	50	50	
100 mm thick concrete panel with— (a) a row of 64 mm steel studs at 600 mm centres, spaced 25 mm from the concrete panel; and (b) 80 mm thick polyester insulation or 50 mm thick glass wool insulation with a density of 11 kg/m³, positioned between studs; and (c) two layers of 13 mm plasterboard fixed to outside face of studs and one layer of 13 mm plasterboard fixed to outside face of concrete panel.	50	50	
125 mm thick concrete panel with— (a) a row of 64 mm steel studs at 600 mm centres, spaced 20 mm from the concrete panel; and (b) 70 mm polyester insulation with a density of 9 kg/m³, positioned between studs; and (c) one layer of 13 mm plasterboard fixed to the outside face of the studs.	50	50	
125 mm thick concrete panel.	-	50	

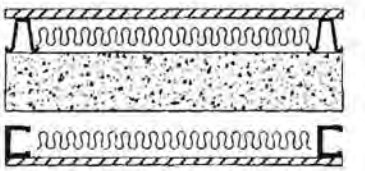
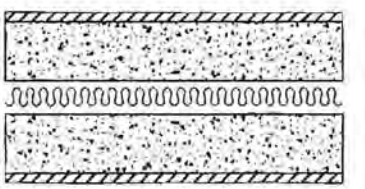
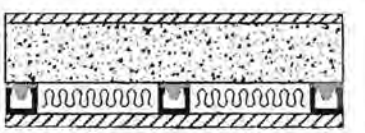
Deemed-to-Satisfy Provisions

Table 2 ACCEPTABLE FORMS OF CONSTRUCTION FOR WALLS (Continued)

Description	$R_w + C_{tr}$ (not less than)	R_w (not less than)	Construction
100 mm concrete panel with 13 mm cement render or one layer of 13 mm plasterboard on each face.	-	50	
190 mm thick concrete blockwork.	-	45	
140 mm thick concrete blockwork, the face shell thickness of the blocks being not less than 44 mm and with— (a) 50 mm x 50 mm timber battens spaced at not more than 610 mm centres screw-fixed on one face of the blocks into resilient plugs with rubber inserts between battens and the wall; and (b) the face of the battens clad with 13 mm plasterboard.	-	45	
Concrete panel - 100 mm thick.	-	45	
Note: For the purposes of this table the term "concrete panel" is a reference to a solid in-situ concrete panel or solid precast concrete panel.			
Wall construction type: Autoclaved aerated concrete			
75 mm thick autoclaved aerated concrete wall panel with— (a) a row of 64 mm steel studs at 600 mm centres, spaced 20 mm from the autoclaved aerated concrete wall panel; and (b) 75 mm thick glass wool insulation with a density of 11 kg/m^3 positioned between studs; and (c) one layer of 10 mm moisture resistant plasterboard or 13 mm fire protective grade plasterboard fixed to outside face of studs and outside face of autoclaved aerated concrete wall panel.	50	50	

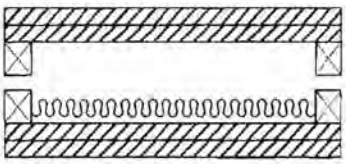
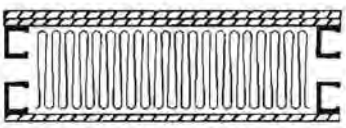
Deemed-to-Satisfy Provisions

Table 2 ACCEPTABLE FORMS OF CONSTRUCTION FOR WALLS (Continued)

Description	$R_w + C_{tr}$ (not less than)	R_w (not less than)	Construction
75 mm thick autoclaved aerated concrete wall panel with— (a) a row of 64 mm steel studs at 600 mm centres, spaced 35 mm from the autoclaved aerated concrete panel wall; and (b) 28 mm metal furring channels fixed to the outside face of the autoclaved aerated concrete wall panel, with 50 mm thick polyester insulation with a density of 9 kg/m^3 positioned between furring channels and one layer of 13 mm fire protective grade plasterboard fixed to furring channels; and (c) 105 mm thick glass wool insulation with a density of 7 kg/m^3 positioned between studs; and (d) one layer of 13 mm fire protective grade plasterboard fixed to the outside face of the studs.	50	50	
Two leaves of 75 mm autoclaved aerated concrete wall panel with— (a) a cavity not less than 30 mm between panels containing 50 mm glass wool insulation with a density of 11 kg/m^3; and (b) one layer of 10 mm plasterboard fixed to outside face of each panel.	50	50	
75 mm thick autoclaved aerated concrete wall panel with— (a) one layer of 10 mm moisture resistant plasterboard on one face; and (b) 28 mm metal furring channels and resilient mounts, 75 mm polyester insulation with a density of 9 kg/m^3 and 13 mm fire protective grade plasterboard fixed to the other face.	-	50	

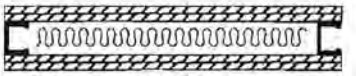
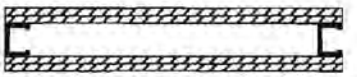
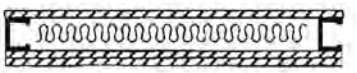
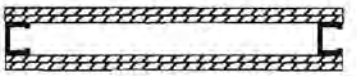
Deemed-to-Satisfy Provisions

Table 2 ACCEPTABLE FORMS OF CONSTRUCTION FOR WALLS (Continued)

Description	$R_w + C_{tr}$ (not less than)	R_w (not less than)	Construction
Wall construction type: Timber and steel framing			
Two rows of 90×35 mm timber studs or two rows of 64 mm steels studs at 600 mm centres with— (a) an air gap not less than 20 mm between the rows of studs; and (b) 50 mm thick glass wool insulation or 60 mm thick polyester insulation with a density of 11 kg/m³; positioned between one row of studs; and (c) two layers of 13 mm fire protective grade plasterboard or one layer of 6 mm fibre cement sheet and one layer of 13 mm fire protective grade plasterboard, fixed to outside face of studs.	50	50	
Two rows of 64 mm steel studs at 600 mm centres with— (a) an air gap not less than 80 mm between the rows of studs; and (b) 200 mm thick polyester insulation with a density of 14 kg/m³; positioned between studs; and (c) one layer of 13 mm fire-protective grade plasterboard and one layer 13 mm plasterboard on one outside face and one layer of 13 mm fire-protective grade plasterboard on the other outside face.	50	50	

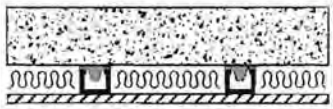
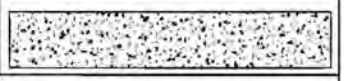
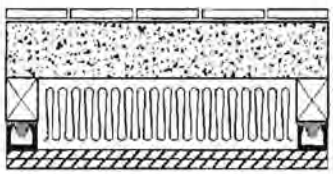
Deemed-to-Satisfy Provisions

Table 2 ACCEPTABLE FORMS OF CONSTRUCTION FOR WALLS (Continued)

Description	$R_w + C_{tr}$ (not less than)	R_w (not less than)	Construction
One row of 92 mm steel studs at 600 mm centres with— (a) 50 mm thick glass wool insulation with a density of 11 kg/m^3 or 60 mm thick polyester insulation with a density of 8 kg/m^3, positioned between studs; and (b) two layers of 13 mm fire protective grade plasterboard or one layer of 6 mm fibre cement sheet and one layer of 13 mm fire protective grade plasterboard, fixed to each face.	-	50	
One row of 64 mm steel studs with 2 layers of 16 mm fire-protective grade plasterboard fixed to each face.	-	45	
One row of 64 mm steel studs with— (a) 1 layer of 16 mm fire-protective grade plasterboard fixed to one face; and (b) 50 mm thick mineral insulation or glass wool insulation with a density of 11 kg/m^3 positioned between the studs; and (c) 2 layers of fire-protective grade plasterboard fixed to the other face, the inner layer being 16 mm thick and the outer layer being 13 mm.	-	45	
One row of 64 mm steel studs with 2 layers of 13 mm plasterboard on each face.	-	45	

Deemed-to-Satisfy Provisions

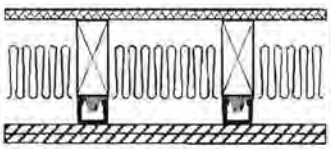
Table 3 ACCEPTABLE FORMS OF CONSTRUCTION FOR FLOORS

Description	$R_w + C_{tr}$ (not less than)	$L_{n,w} + C_i$ (not more than)	R_w (not less than)	Construction
Floor construction type: Concrete				
150 mm thick concrete slab with— (a) 28 mm metal furring channels and isolation mounts fixed to underside of slab, at 600 mm centres; and (b) 65 mm thick polyester insulation with a density of 8 kg/m^3, positioned between furring channels; and (c) one layer of 13 mm plasterboard fixed to furring channels.	50	62	50	
200 mm thick concrete slab with carpet on underlay.	50	62	50	
100 mm thick concrete slab.	45	-	45	
Floor construction type: Autoclaved aerated concrete				
75 mm thick autoclaved aerated concrete floor panel with— (a) 8 mm ceramic tiles with flexible adhesive and waterproof membrane, located above the slab; and (b) timber joists at 600 mm centres; and (c) R1.5 glass wool insulation positioned between timber joists; and (d) 28 mm metal furring channels and resilient mounts fixed to underside of joists; and (e) two layers of 13 mm plasterboard fixed to furring channels.	50	62	50	

F HEALTH AND AMENITY

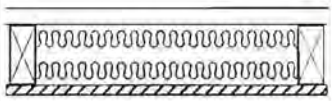
Deemed-to-Satisfy Provisions

Table 3 ACCEPTABLE FORMS OF CONSTRUCTION FOR FLOORS (Continued)

Description	$R_w + C_{tr}$ (not less than)	$L_{n,w} + C_I$ (not more than)	R_w (not less than)	Construction
Floor construction type: Timber				
19 mm thick chipboard floor sheeting with— (a) 190×45 mm timber joists at 450 mm centres; and (b) R2.5 glass wool insulation positioned between timber joists; and (c) 28 mm metal furring channels and isolation mounts fixed to underside of joists, isolation mounts to be of natural rubber with a dynamic factor of not more than 1.1 and static deflection of not less than 3 mm at actual operating load; and (d) two layers of 16 mm fire-protective grade plasterboard fixed to furring channels.	50	62	50	

Deemed-to-Satisfy Provisions

Table 3 ACCEPTABLE FORMS OF CONSTRUCTION FOR FLOORS (Continued)

Description	$R_w + C_{tr}$ (not less than)	$L_{n,w} + C_I$ (not more than)	R_w (not less than)	Construction
19 mm thick tongued and grooved boards with— (a) timber joists not less than 175 mm x 50 mm; and (b) 75 mm thick mineral insulation or glass wool insulation with a density of 11 kg/m^3 positioned between joists and laid on 10 mm thick plasterboard fixed to underside of joists; and (c) 25 mm thick mineral insulation or glass wool insulation with a density of 11 kg/m^3 laid over entire floor, including tops of joists before flooring is laid; and (d) secured to 75 mm×50 mm battens; and (e) the assembled flooring laid over the joists, but not fixed to them, with the battens lying between the joists.	-	-	45	

SPECIFICATION F5.5 IMPACT SOUND — TEST OF EQUIVALENCE

Deemed-to-Satisfy Provisions

1. Scope

This Specification describes a method of test to determine the comparative resistance of walls to the transmission of impact sound.

2. Construction to be tested

(a) The test is conducted on a specimen of prototype wall construction and on a specimen of one or other of the constructions specified in **Table 2 of Specification F5.2**.

(b) The testing of a construction specified in **Table 2 of Specification F5.2** need not be repeated for subsequent comparisons provided complete records of the results, the test equipment and the technique of testing are kept so that identical equipment can be employed and an identical technique can be adopted in the testing of specimens of prototype wall construction.

3. Method

(a) The wall constructions to be compared must be tested in accordance with AS 1191.

(b) A horizontal steel platform 510 mm x 460 mm x 10 mm thick must be placed with one long edge in continuous and direct contact with the wall to be tested on the side of the wall on which the impact sound is to be generated.

(c) A tapping machine complying with ISO 140/6 — 1998 (E) must be mounted centrally on the steel platform.

(d) The sound transmission through the wall must be determined in accordance with AS 1191 except that the tapping machine as mounted on the steel platform must be used as the source of sound.

(e) The impact sound pressure levels measured in the receiving room must be converted into normalised levels using a reference equivalent absorption area of 10 m^2.

SECTION G

ANCILLARY PROVISIONS

SECTION G CONTENTS

PART G1 MINOR STRUCTURES AND COMPONENTS

OBJECTIVE

GO1

The *Objective* of this Part is to—

(a) safeguard people from illness caused by the discharge of *swimming pool* waste water; and

(b) protect *other property* from damage caused by the discharge of *swimming pool* waste water; and

(c) safeguard young children from drowning or injury in a *swimming pool*; and

Application

GO1(a) and **(b)** do not apply in NT.

GO1(c) does not apply in NT and Qld.

GO1(c), in ACT, SA, Tas and WA, only applies to a *swimming pool* associated with a Class 2 or 3 building or Class 4 part of a building, with a depth of water more than 300 mm.

GO1(c), in Vic, only applies to a *swimming pool* with a depth of water more than 300 mm, associated with—

(a) a Class 2 or 3 building or Class 4 part of a building; or

(b) a *children's service*.

GO1(c), in NSW, only applies to a *swimming pool* with a depth of water of 300 mm or more, in conjunction with the Swimming Pools Act 1992 and the Swimming Pools Regulation 2008.

(d) safeguard people from drowning or injury due to suction by a *swimming pool* water recirculation system.

Application

GO1(d) only applies to a *swimming pool* with a depth of water more than 300 mm.

(e) safeguard occupants from illness or injury resulting from being accidentally locked inside spaces which are designed to be entered for short periods of time only and in which occupation for longer periods may be hazardous.

(f) safeguard young children in outdoor play spaces.

Application

GO1(f) only applies to a Class 9b *early childhood centre*.

Tas GO1(f), (g), (h)

FUNCTIONAL STATEMENTS

GF1.1

Adequate means for the disposal of *swimming pool* water and drainage is to be provided to a *swimming pool*.

Application

GF1.1 does not apply in NT.

GF1.2

A *swimming pool* is to be provided with—

(a) means of restricting access by young children to it; and

Application

GF1.2(a) does not apply in NT and Qld.

GF1.2(a), in ACT, SA, Tas and WA, only applies to a *swimming pool* associated with a Class 2 or 3 building or Class 4 part of a building, with a depth of water more than 300 mm.

GF1.2(a), in Vic, only applies to a *swimming pool* with a depth of water more than 300 mm, associated with—

(a) a Class 2 or 3 building or Class 4 part of a building; or

(b) a *children's service*.

GF1.2(a), in NSW, only applies to a *swimming pool* with a depth of water of 300 mm or more, in conjunction with the Swimming Pools Act 1992 and the Swimming Pools Regulation 2008.

(b) means to reduce the possibility of a person being entrapped or injured due to suction by a water recirculation system.

Application

GF1.2(b) only applies to a *swimming pool* with a depth of water more than 300 mm.

GF1.3

Any refrigerated or cooling chamber, strong-room and vault or the like that is capable of accommodating a person is to have safety measures to facilitate escape and for alerting people outside such a space in the event of an emergency.

TAS GF1.4–1.6

GF1.4

An outdoor play space is to be provided with a means of restricting the passage of children to outside of the play space.

Application

GF1.4 only applies to a Class 9b *early childhood centre*.

PERFORMANCE REQUIREMENTS

GP1.1

A *swimming pool* must have adequate means of draining the pool in a manner which will not—

(a) cause illness to people; or

(b) affect *other property*.

Application

GP1.1 does not apply in NT.

GP1.2

(a) A barrier must be provided to a *swimming pool* and must—

(i) be continuous for the full extent of the hazard; and

(ii) be of a strength and rigidity to withstand the foreseeable impact of people; and

(iii) restrict the access of young children to the pool and the immediate pool surrounds; and

(iv) have any gates and doors fitted with latching devices not readily operated by young children, and constructed to automatically close and latch.

Application

GP1.2(a) does not apply in NT and Qld.

GP1.2(a), in ACT, SA, Tas and WA, only applies to a *swimming pool* associated with a Class 2 or 3 building or Class 4 part of a building, with a depth of water more than 300 mm.

GP1.2(a), in Vic, only applies to a *swimming pool* with a depth of water more than 300 mm, associated with—

(a) a Class 2 or 3 building or Class 4 part of a building; or

(b) a *children's service*.

GP1.2(a), in NSW, only applies to a *swimming pool* with a depth of water of 300 mm or more, in conjunction with the Swimming Pools Act 1992 and the Swimming Pools Regulation 2008.

(b) A *swimming pool* water recirculation system must incorporate safety measures to avoid entrapment of, or injury to, a person.

Application

GP1.2(b) only applies to a *swimming pool* with a depth of water more than 300 mm.

GP1.3

Any refrigerated or cooling chamber, or the like which is of sufficient size for a person to enter must—

(a) have adequate means of communicating with or alerting other occupants in the building in the case of an emergency; and

(b) have a door which is—

(i) of adequate dimensions to allow occupants to readily escape; and

(ii) openable from inside without a key at all times.

GP1.4

Any strong-room, vault or the like which is of sufficient size for a person to enter must—

(a) have adequate means of communicating with or alerting other occupants in the building in the case of an emergency; and

(b) have internal lighting controllable only from within the room; and

(c) have an external indicator that the room is occupied.

GP1.5

Fencing or other barriers must be provided around any outdoor play space, in which the design and height of the fencing or other barriers, including the—

(a) design of gates and fittings; and

(b) proximity of the barriers to any permanent structure on the property,

must ensure that children cannot go through, over or under the fencing or other barriers.

Application

GP1.5 only applies to a Class 9b *early childhood centre*.

Tas GP1.5–1.9

PART G1 MINOR STRUCTURES AND COMPONENTS

Deemed-to-Satisfy Provisions

G1.0 Deemed-to-Satisfy Provisions

(a) *Performance Requirement* **GP1.1** must be complied with.

There is no *Deemed-to-Satisfy Provision* for this *Performance Requirement*.

Tas G1.0(b)

(b) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **GP1.2** to **GP1.5** are satisfied by complying with **G1.1** to **G1.3**.

(c) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **G1.1** to **G1.3**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

G1.1 Swimming pools

(a) **Application:**

(i) **NSW:**

(A) Safety fencing: **G1.1(b)** to **(d)** apply to the technical construction requirements for barriers to restrict access to *swimming pools*, subject to the walls of above ground pools, including inflatable pools, not being considered to be effective barriers.

Note: The Swimming Pools Act 1992 and the Swimming Pools Regulation 2008, applicable to *swimming pools* with a depth of water of 300 mm or more, regulate the circumstances in which a barrier is required and prevail in the case of any inconsistency.

(B) Water recirculation system: **G1.1(e)** applies to the requirements for water recirculation systems.

The provisions of **(b)** do not apply in the Northern Territory and Queensland as follows:

(ii) **Northern Territory**—all provisions: swimming pools are controlled under the *Northern Territory of Australia Swimming Pool Safety Act 2004*.

(iii) **Queensland**—safety fencing: restriction of access to swimming pools is regulated under the Queensland Building Act 1975 and the Standard Building Regulation.

(b) **Safety fencing:** Subject to **(c)** and **(d)**, a *swimming pool* associated with a Class 2 or 3 building or Class 4 part of a building, with a depth of water more than 300 mm must have suitable barriers to restrict access by young children to the immediate pool surrounds in accordance with AS 1926 Parts 1 and 2.

Deemed-to-Satisfy Provisions

Vic G1.1(ba)

(c) A child-resistant doorset must not be used in a barrier for an outdoor *swimming pool*.

(d) A side-hung door forming part of the barrier for an indoor *swimming pool* must be hung so that, when opening, it only swings away from the pool area.

(e) A water recirculation system in a *swimming pool* with a depth of water more than 300 mm must comply with AS 1926.3.

ACT G1.1(f)–(g)

Tas G1.1(f)–(j)

G1.2 Refrigerated chambers, strong-rooms and vaults

(a) A refrigerated or cooling chamber, strongroom or vault which is of sufficient size for a person to enter must have—

(i) a door which is capable of being opened by hand from inside without a key; and

(ii) internal lighting controlled only by a switch which is located adjacent to the entrance doorway inside the chamber, strongroom or vault; and

(iii) an indicator lamp positioned outside the chamber, strongroom or vault which is illuminated when the interior lights *required* by **(a)(ii)** are switched on; and

(iv) an alarm that is—

(A) located outside but controllable only from within the chamber, strongroom or vault; and

(B) able to achieve a sound pressure level outside the chamber, strongroom or vault of 90 dB(A) when measured 3 m from the sounding device.

(b) A door *required* by **(a)(i)** in a refrigerated or cooling chamber must have a doorway with a clear width of not less than 600 mm and a clear height not less than 1.5 m.

G1.3 Outdoor play spaces

(a) Any outdoor play space in a Class 9b *early childhood centre* must be enclosed on all sides with a barrier which complies with AS 1926.1.

(b) For the purposes of **(a)**, AS 1926.1 is applied as if there is a *swimming pool* located outside the outdoor play space, so that the barrier restricts children from exiting the premises without the knowledge of staff in the centre.

(c) The requirements of **(a)** do not apply to a wall, including doors and *windows*, which form part of the Class 9b *early childhood centre*.

NSW G1.101

Qld G101

Tas G101.1, G101.2

PART G2 HEATING APPLIANCES, FIREPLACES, CHIMNEYS AND FLUES

OBJECTIVE

GO2

The *Objective* of this Part is to—

(a) safeguard occupants from illness or injury caused by—

(i) fire from combustion appliances installed within a building; and

(ii) malfunction of a pressure vessel installed within a building; and

(b) protect a building from damage caused by the malfunction of a pressure vessel installed within.

Tas GO2(a)

FUNCTIONAL STATEMENTS

GF2.1

Combustion appliances using controlled combustion located in a building are to be installed in a way which reduces the likelihood of fire spreading beyond the appliance.

Tas GF2.1

GF2.2

Pressure vessels located in a building are to be installed in a manner which will provide adequate safety for occupants.

PERFORMANCE REQUIREMENTS

GP2.1

Where provided in a building, a combustion appliance and its associated components, including an open fire-place, chimney, flue, chute, hopper or the like, must be installed—

(a) to withstand the temperatures likely to be generated by the appliance; and

(b) so that it does not raise the temperature of any building element to a level that would adversely affect the element's physical or mechanical properties or function; and

(c) so that hot products of combustion will not—

(i) escape through the walls of the associated components; and

(ii) discharge in a position that will cause fire to spread to nearby *combuslible* materials or allow smoke to penetrate through nearby *windows*, ventilation inlets, or the like.

Tas GP2.1(c)

GP2.2

When located in a building, a pressure vessel must be installed to avoid, during reasonably foreseeable conditions, the likelihood of—

(a) leakage from the vessel which could cause damage to the building; and

(b) rupture or other mechanical damage of the vessel which could cause damage to the building or injury to occupants.

PART G2 HEATING APPLIANCES, FIREPLACES, CHIMNEYS AND FLUES

Deemed-to-Satisfy Provisions

G2.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **GP2.1** and **GP2.2** are satisfied by complying with **G2.1** to **G2.4**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **G2.1** to **G2.4**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

G2.1 * * * * *

This clause has deliberately been left blank.

G2.2 Installation of appliances

The installation of a stove, heater or similar appliance in a building must comply with:

(a) * * * * *

(b) Domestic solid-fuel burning appliances — Installation: AS/NZS 2918.

Tas G2.2(b)

(c) Pressure equipment: AS/NZS 1200.

ACT G2.2(d), (e)

G2.3 Open fireplaces

An open fireplace, or solid-fuel burning appliance in which the fuel-burning compartment is not enclosed must have—

(a) a hearth constructed of stone, concrete, masonry or similar *non-combustible* material so that—

(i) it extends not less than 300 mm beyond the front of the fireplace opening and not less than 150 mm beyond each side of that opening; and

(ii) it extends beyond the limits of the fireplace or appliance not less than 300 mm if the fireplace or appliance is free-standing from any wall of the room; and

(iii) its upper surface does not slope away from the grate or appliance; and

(iv) *combustible* material situated below the hearth but not below that part *required* to extend beyond the fireplace opening or the limits of the fireplace is not less than 150 mm from the upper surface of the hearth; and

(b) walls forming the sides and back of the fireplace up to not less than 300 mm above the underside of the arch or lintel which—

(i) are constructed in 2 separate leaves of solid masonry not less than 180 mm thick, excluding any cavity; and

(ii) do not consist of concrete block masonry in the construction of the inner leaf; and

(c) walls of the chimney above the level referred to in **(b)**—

(i) constructed of masonry units with a net volume, excluding cored and similar holes, not less than 75% of their gross volume, measured on the overall rectangular shape of the units, and with an actual thickness of not less than 100 mm; and

(ii) lined internally to a thickness of not less than 12 mm with rendering consisting of 1 part cement, 3 parts lime, and 10 parts sand by volume, or other suitable material; and

(d) suitable damp-proof courses or flashings to maintain weatherproofing.

G2.4 Incinerator rooms

(a) If an incinerator is installed in a building any hopper giving access to a charging chute must be—

(i) *non-combustible*; and

(ii) gas-tight when closed; and

(iii) designed to return to the closed position after use; and

(iv) not attached to a chute that connects directly to a flue unless the hopper is located in the open air; and

(v) not located in a *required exit*.

(b) A room containing an incinerator must be separated from other parts of the building by construction with an FRL of not less than 60/60/60.

PART G3 ATRIUM CONSTRUCTION

Deemed-to-Satisfy Provisions

Note:

Part G3 contains *Deemed-to-Satisfy Provisions* additional to those contained in **Sections C**, **D** and **E** for *Atrium* Construction.

G3.1 Atriums affected by this Part

This Part does not apply to an *atrium* which—

(a) connects only 2 *storeys*; or

(b) connects only 3 *storeys* if—

(i) each *storey* is provided with a sprinkler system complying with **Specification E1.5** throughout; and

(ii) one of those *storeys* is situated at a level at which there is direct egress to a road or *open space*.

G3.2 Dimensions of atrium well

An *atrium well* must have a width throughout the well that is able to contain a cylinder having a horizontal diameter of not less than 6 m.

G3.3 Separation of atrium by bounding walls

An *atrium* must be separated from the remainder of the building at each *storey* by bounding walls set back not more than 3.5 m from the perimeter of the *atrium well* except in the case of the walls at no more than 3 consecutive *storeys* if—

(a) one of those *storeys* is at a level at which direct egress to a road or *open space* is provided; and

(b) the sum of the *floor areas* of those *storeys* that are contained within the *atrium* is not more than the maximum area that is permitted in **Table C2.2**.

G3.4 Construction of bounding walls

Bounding walls must—

(a) have an FRL of not less than 60/60/60, and—

(i) extend from the floor of the *storey* to the underside of the floor next above or to the underside of the roof; and

(ii) have any door openings protected with *self-closing* or *automatic* –/60/30 fire doors; or

(b) be constructed of fixed toughened safety glass, or wired safety glass in *non-combustible* frames, with—

Deemed-to-Satisfy Provisions

(i) any door openings fitted with a *self-closing* smoke door complying with **Specification C3.4**; and

(ii) the walls and doors protected with wall-wetting systems in accordance with **Specification G3.8**; and

(iii) a fire barrier with an FRL of not less than –/60/30 installed in any ceiling spaces above the wall.

G3.5 Construction at balconies

If a bounding wall separating an *atrium* from the remainder of the building is set back from the perimeter of the *atrium well*, a balustrade or other barrier that is imperforate and *non-combustible*, and not less than 1 m high must be provided.

G3.6 Separation at roof

In an *atrium*—

(a) the roof must have the FRL prescribed in **Table 3 of Specification C1.1**; or

(b) the roof structure and membrane must be protected by a sprinkler system complying with **Specification E1.5**.

G3.7 Means of egress

All areas within an *atrium* must have access to at least 2 *exits*.

G3.8 Fire and smoke control systems

Sprinkler systems, smoke control, fire detection and alarm systems, and sound systems and intercom system for emergency purposes must be installed in compliance with **Specification G3.8**.

SPECIFICATION G3.8 FIRE AND SMOKE CONTROL SYSTEMS IN BUILDINGS CONTAINING ATRIUMS

Deemed-to-Satisfy Provisions

1. SCOPE

This Specification sets out the requirements for the design and operation of systems of fire and smoke control in buildings containing an *atrium*.

2. AUTOMATIC FIRE SPRINKLER SYSTEM

2.1 General requirement

A sprinkler system complying with **Specification E1.5** must be installed in every building containing an *atrium*, except where varied or superseded by this Specification.

2.2 Roof protection

A roof of an *atrium* which does not have the FRL prescribed in **Specification C1.1** or the *Deemed-to-Satisfy Provisions* of **Part C2** must be protected by *automatic* sprinklers arranged to wet both the covering membrane and supporting structure if the roof is—

(a) less than 12 m above the floor of the *atrium* or the floor of the highest *storey* where the bounding construction is set back more than 3.5 m from the *atrium well* if a Class 2, 3, 5 or 9 part of a building is open to the *atrium*; or

(b) less than 20 m above the floor of the *atrium* or the floor of the highest *storey* where the bounding construction is set back more than 3.5 m from the *atrium well* if a Class 6, 7 or 8 part of a building is open to the *atrium*,

and the temperature rating of sprinkler heads providing roof protection must be within the range 79°C–100°C.

2.3 Atrium floor protection

The floor of the *atrium* must be protected by sprinklers with—

(a) the use of sidewall pattern sprinkler heads together with overhead sprinklers where dictated by the dimensions of the *atrium*; and

(b) sprinkler heads of the fast response type, installed with suitable *non-combustible* heat collector plates of 200 mm minimum diameter to ensure activation by a rising fire plume.

Deemed-to-Satisfy Provisions

2.4 Sprinkler systems to glazed walls

2.4.1 Location of protection

Where an *atrium* is separated from the remainder of the building by walls or doors incorporating glazing, a wall wetting system with suitable *non-combustible* heat collector plates of 200 mm diameter must be provided to protect the glazing as follows:

(a) On the *atrium* side of the glazing — to all glazed walls which are set back more than 3.5 m from the *atrium well*.

(b) On the *atrium* side of the glazing — to all glazed walls which are not set back, or are set back 3.5 m or less, from the *atrium well*, for all levels which are less than—

  (i) 12 m above the floor of an *atrium* or the floor of the highest *storey* where the bounding wall is set back more than 3.5 m from the *atrium well* if a Class 2, 3, 5 or 9 part of the building is open to the *atrium*; or

  (ii) 20 m above the floor of an *atrium* or the floor of the highest *storey* where the bounding wall is set back more than 3.5 m from the *atrium well* if a Class 6, 7 or 8 part of the building is open to the *atrium*.

(c) On the side of the glazing away from the *atrium well*—to all glazing forming part of the bounding wall at each *storey*.

2.4.2 Sprinkler head location

Sprinklers must be located in positions allowing full wetting of the glazing surfaces without wetting adjacent sprinkler heads.

2.4.3 Head rating and response time

Sprinkler heads must be of the fast response type and have a maximum temperature rating of 74°C.

2.4.4 Water discharge rate

The rate of water discharge to protect glazing must be not less than—

(a) on the *atrium* side of the glazing—

  (i) 0.25 L/s.m^2 where glazing is not set back from the *atrium well*, or

  (ii) 0.167 L/s.m^2 where glazing is set back from the *atrium well*, and

(b) on the side away from the *atrium well*—0.167 L/s.m^2.

2.4.5 Water supply

In addition to that of the basic sprinkler protection for the building, the water supply to *required* wall wetting systems must be of adequate capacity to accommodate the following on the *atrium* side of the glazing:

(a) Where the bounding walls are set back less than 3.5 m from the *atrium well*—wall wetting of a part not less than 6 m long for a height of not less than—

  (i) 12 m above the floor of an *atrium* or the floor of the highest *storey* where the bounding wall is set back more than 3.5 m from the *atrium well* if a Class 2, 3, 5 or 9 part of the building is open to the *atrium*; or

(ii) 20 m above the floor of an *atrium* or the floor of the highest *storey* where the bounding wall is set back more than 3.5 m from the *atrium well* if a Class 6, 7 or 8 part of the building is open to the *atrium*; and

(b) Where the walls are set back 3.5 m or more from the *atrium well* — wetting of a part not less than 12 m long on one *storey*.

2.5 Stop valves

(a) Basic sprinkler and wall wetting systems protecting a building containing an *atrium* must be provided with easily accessible and identified stop valves.

(b) Sprinkler and wall wetting systems must be provided with independent stop valves.

(c) Sprinkler heads protecting the roof of the *atrium* must be provided with a stop valve.

(d) Stop valve to wall wetting and roof sprinklers may be of the gate type.

(e) All sprinkler and wall wetting stop valves must be monitored to detect unauthorised closure.

3. SMOKE CONTROL SYSTEM

3.1 General requirements

Except where varied or superseded by this Specification, mechanical air-handling systems in a building containing an *atrium* must comply with AS/NZS 1668.1.

3.2 Operation of atrium mechanical air-handling systems

Mechanical air-handling systems serving an *atrium* must be designed to operate so that during a fire—

(a) a tenable atmosphere is maintained in all paths of travel along balconies to *required exits* during the period of evacuation; and

(b) smoke exhaust fans serving the *atrium* are only activated when smoke enters the *atrium*; and

(c) central plant systems do not use the *atrium* as a return air path; and

(d) central plant systems which use return air paths remote from the *atrium*—

(i) cycle to the full outside air mode; and

(ii) stop supply air to the fire affected *storey* or *fire compartment*; and

(iii) continue to fully exhaust the fire affected *storey* or *fire compartment* and reduce the exhaust from other *storeys* or *fire compartments* by at least 75%; and

(iv) continue to supply air to *fire compartments* or *storeys* other than the fire affected *storey* or *fire compartment*; and

(e) fans performing relief or exhaust duty from the *atrium* stop normal operation; and

(f) floor by floor, or unitary, air-handling plant serving a single *fire compartment* or *storey*—

(i) ceases normal operation in the fire affected *storey* or *fire compartment*; and

(ii) commences full relief or exhaust from that fire affected *storey* or *fire compartment*; and

(iii) continue to supply air to *fire compartments* or *storeys* other than the fire affected *storey* or *fire compartment*.

3.3 Activation of smoke control system

(a) The smoke control system must be activated by—

(i) operation of an *automatic* fire alarm; or

(ii) operation of the sprinkler system; or

(iii) a manual start switch.

(b) All controls for the smoke control system must be located—

(i) in the fire control room; or

(ii) in the emergency control centre, (if any); or

(iii) adjacent to the sprinkler control valves; or

(iv) incorporated in the Fire Indicator Panel.

3.4 Smoke exhaust system

A smoke exhaust system serving an *atrium* must be designed on the basis of—

(a) the sprinkler system limiting the size of a fire to—

(i) a heat output of 1.5 MW and perimeter of 7.5 m if a Class 2, 3, 5 or 9 part of the building is open to the *atrium*; or

(ii) a heat output of 5 MW and perimeter of 12 m if a Class 6, 7 or 8 part of the building is open to the *atrium*; and

(b) a smoke plume reaching a level 3 m above the highest *storey* having a path of travel to a *required exit* along a balcony bounding the *atrium well*, and not less than—

(i) 12 m above the floor of an *atrium* or the floor of the highest *storey* where the bounding wall is set back more than 3.5 m from the *atrium well* if a Class 2, 3, 5 or 9 part of the building is open to the *atrium*; or

(ii) 20 m above the floor of an *atrium* or the floor of the highest *storey* where the bounding construction is set back more than 3.5 m from the *atrium well* if a Class 6, 7 or 8 part of the building is open to the *atrium*; and

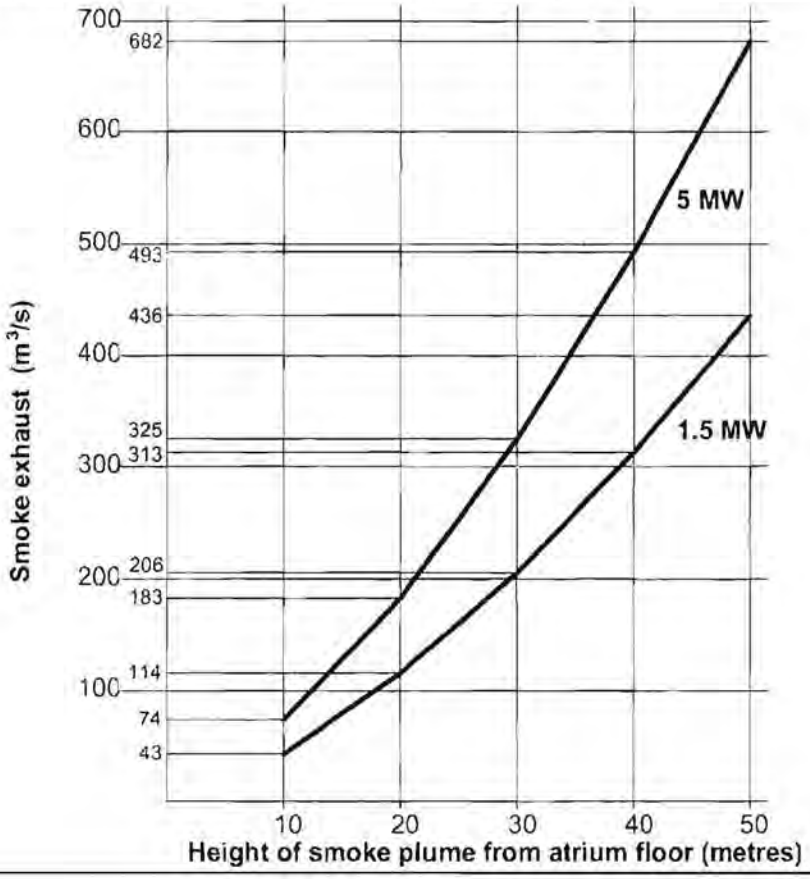
(c) the smoke exhaust system discharging smoke at a rate of not less than that shown in **Figure 3.4** for the appropriate height of smoke plume and fire size—

(i) from the top of the *atrium*; or

(ii) horizontally where calculations of wind velocity induced pressure profiles for the building verify that the exhaust system will operate effectively for all wind directions.

Figure 3.4

SMOKE EXHAUST RATE



3.5 Upward air velocity

Notwithstanding **3.4(c)**, the average upward air velocity in the *atrium*, due to the *required* smoke exhaust quantity must—

(a) be not less than 0.2 m/s at any level over an 18 m height above the floor of the *atrium*; and

(b) not exceed the following maximum velocities in *atriums* of constant cross sectional plan area—

(i) for occupancy classification qualifying for 1.5 MW fire size — 3.5 m/s.

(ii) for occupancy classifications qualifying for 5 MW fire size — 5 m/s.

Deemed-to-Satisfy Provisions

3.6 Exhaust fans

(a) Smoke exhaust must be provided by fans capable of continuous and *required* operation for a period of not less than 1 hour when handling exhaust gases at 200°C.

(b) Where a Class 2, 3 or 9 part of a building adjoins an *atrium*, the *atrium* must be provided with a minimum of 3 fans each capable of 50% of the total *required* smoke exhaust capacity.

(c) *Atriums* other than those referred to in **(b)** must be provided with a minimum of 2 fans each capable of 50% of the total *required* smoke exhaust capacity.

3.7 Smoke and heat vents

Notwithstanding **Clause 3.6**, *automatic* vents complying with AS 2665 may be used, except where a Class 6 part of a building adjoins the *atrium*, in lieu of exhaust fans provided that—

(a) the height from the *atrium* floor to the bottom of the highest vent is not more than 12 m; and

(b) the vents are fitted with a remote manual operation switch located adjacent to the sprinkler control valves or incorporated in the Fire Indicator Panel.

3.8 Make-up air supply

(a) Uniformly distributed make-up air must be provided to the *atrium* exhaust system from—

  (i) outside the *atrium* at or near the lowest *storey* level; and

  (ii) relief air from non-fire *storeys*.

(b) A discharge volume sufficient to maintain a velocity of not less than 0.1 m/s towards the *atrium well* must be provided on all *storeys* where the bounding wall is set back from the *atrium well*.

(c) The requirements of **(a)(i)** are satisfied if make-up air is provided to the *atrium* exhaust system in such a manner as to prevent, as far as possible, disturbance of the smoke layer due to turbulence created by the incoming air, through—

  (i) openings directly from the outside air to the *atrium* and located as close as practicable to the lowest level of the *atrium*; or

  (ii) ducts from the outside air to the *atrium* which deliver air as close as practicable to the lowest level of the *atrium* and, where passing through any other *fire compartment* having an FRL of at least 60/60/60; or

  (iii) a combination of **(i)** or **(ii)**.

Deemed-to-Satisfy Provisions

4. FIRE DETECTION AND ALARM SYSTEM

4.1 General requirements

Except where superseded by this Specification, *automatic* fire detection and alarm systems in a building containing an *atrium* must comply with AS 1670.1.

4.2 Smoke detection system

Smoke detection within an *atrium*—

(a) must be provided within all outside air intakes and at individual floor return air intakes of all air-handling systems to initiate *automatic* fire mode operation, and where applicable, comply with the restart facilities in AS/NZS 1668.1; and

(b) must operate at an obscuration level not greater than 0.5% per metre with compensation for external airborne contamination as necessary; and

(c) must sample air within the *atrium* and in *storeys* where the bounding wall is set back more than 3.5 m from the *atrium well*; and

(d) must be calibrated to compensate for smoke dilution where sampling occurs within return air path common to more than one room; and

(e) may incorporate beam type detectors to sense smoke in an *atrium* in a Class 5, 6, 7 or 8 building with an *effective height* of not more than 25 m if—

(i) the beam detectors are located at intervals of not more than 3 *storeys*; and

(ii) arranged to scan at 90 degrees orientation to adjacent beam units.

4.3 Smoke detection in spaces separated from the atrium by bounding walls

Smoke detection systems must be located at all return and relief air openings associated with the building air-handling systems and be—

(a) of the sampling type system as *required* in **4.2**; or

(b) of the point type photoelectric smoke detector.

4.4 Alarm systems

(a) A break-glass fire alarm point must be provided at each door to a *fire-isolated stairway*, *fire-isolated ramp*, or *fire-isolated passageway*.

(b) A staged alarm must be provided where an air sampling type smoke detection system is provided for the *atrium*, and must operate as follows:

(i) Alert building management when abnormal smoke levels of 0.03% obscuration per metre are detected.

(ii) Initiate a second alarm to management and start all smoke control systems including pressurisation of escape routes when smoke levels of 0.07% obscuration per metre are detected.

Deemed-to-Satisfy Provisions

(iii) Automatically call the *fire brigade*, activate the sound system and intercom system for emergency purposes, and de-activate all plant not necessary for fire safety within the building when smoke levels of 0.09% obscuration per metre are detected.

(c) Beam and point type smoke detectors *required* must simultaneously operate all functions referred to above and activate at the level set out in AS/NZS 1668.1.

5. SOUND SYSTEMS AND INTERCOM SYSTEMS FOR EMERGENCY PURPOSES

All buildings containing an *atrium* must be provided with a sound system and intercom system for emergency purposes which—

(a) complies with AS 1670.4; and

(b) incorporates visual warning devices that—

(i) operate upon the evacuation signal; and

(ii) display the words "EVACUATE" in red with letters conforming with the requirements of the *Deemed-to-Satisfy Provisions* of **Part E4** for *exit* signs.

6. STANDBY POWER SYSTEM

(a) If a *required* path of travel to an *exit* is within an *atrium*, a suitable alternative power supply must be provided to operate *required* safety systems, including sprinkler systems and fire hydrant pumps, air handling systems, alarms, warning and communication systems and emergency lighting circuits.

(b) The alternative power supply must—

(i) be connected *automatically* if the normal power supply fails; and

(ii) if located within the building, be separated from the remainder of the building by an enclosure with an FRL of at least 120/120/120; and

(iii) be connected to the safety systems by means of cabling complying with **C2.13(c)(iii)** and **(iv)**.

(c) The requirements of **(a)** are satisfied by—

(i) a single medium voltage supply taken from an electricity substation situated within, or adjacent to, the building concerned where the power supply to the substation consists of two or more high voltage cables each taking electricity from separate transformers; or

(ii) two or more medium voltage supplies each taking electricity from separate electricity substations situated—

(A) outside the building concerned; and

(B) at a suitable distance from each other; or

(iii) a single medium voltage supply taken from an electricity substation together with an electricity generating plant capable of—

(A) generating a medium voltage supply; and

(B) starting and taking the *required* electrical load within a period of not more than 30 seconds from the time of normal supply failure.

7. SYSTEM FOR EXCLUDING SMOKE FROM FIRE-ISOLATED EXITS

Required fire-isolated *exits* in a building containing an *atrium* must be protected from the entry of smoke in accordance with **E2.2**.

PART G4 CONSTRUCTION IN ALPINE AREAS

OBJECTIVE

GO4

The *Objective* of this Part is to safeguard occupants in *alpine areas* from illness or injury from an emergency while evacuating a building.

Application

GO4 applies to a building constructed in an *alpine area* and overrules other provisions of the BCA.

FUNCTIONAL STATEMENT

GF4.1

A building in an *alpine area* is to be provided with additional measures in view of the increased difficulties in fire-fighting and maintaining access and means of egress in snow conditions.

Application

GF4.1 applies to a building constructed in an *alpine area* and overrules other provisions of the BCA.

PERFORMANCE REQUIREMENTS

GP4.1

An external doorway from a building in an *alpine area* must be installed so that opening the door is not obstructed by snow or ice.

Application

GP4.1 applies to a building constructed in an *alpine area* overrules other provisions of the BCA.

GP4.2

A building in an *alpine area* containing external trafficable structures forming part of the means of egress must be constructed so that those structures remain, as far as practicable, useable under snow conditions.

Application

GP4.2 applies to a building constructed in an *alpine area* and overrules other provisions of the BCA.

GP4.3

A building in an *alpine area* must be constructed so that snow or ice is not shed from the building onto the allotment, any adjoining allotment, road or public space in a location or manner that will—

(a) obstruct a means of egress from any building to a road or *open space;* or

(b) otherwise endanger people.

Application

GP4.3 applies to a building constructed in an *alpine area* and overrules other provisions of the BCA.

GP4.4

A building in an *alpine area* must have a *fire safety system* installed to—

(a) facilitate fire-fighting operations; and

(b) alert occupants in the event of an emergency.

Application

GP4.4 applies to a building constructed in an *alpine area* and overrules other provisions of the BCA.

PART G4 CONSTRUCTION IN ALPINE AREAS

Deemed-to-Satisfy Provisions

G4.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **GP4.1** to **GP4.4** are satisfied by complying with **G4.1** to **G4.9**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **G4.1** to **G4.9**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

G4.1 Application of Part

(a) The *Deemed-to-Satisfy Provisions* of this Part apply to any building constructed in an *alpine area* in addition to other *Deemed-to-Satisfy Provisions* of the BCA.

(b) Where any *Deemed-to-Satisfy Provisions* are in conflict, the provisions of this Part take precedence.

G4.2 * * * * *

This clause has deliberately been left blank.

G4.3 External doorways

(a) A door fitted to an external doorway which may be subject to the build-up of snow must—

(i) only be capable of opening inwards; and

(ii) be marked "OPEN INWARDS" on the inside face of the door in letters not less than 75 mm high and in a colour contrasting with that of the background; and

(iii) if it serves a corridor or stairway, be positioned in an alcove or recess with—

(A) no horizontal dimension less than twice the width of the door; and

(B) the door positioned to open against a wall such that the distance from any part of its swing to the nearest point of entry of the stairway or corridor is not less than the width of the door.

(b) Every threshold of a *required exit* doorway must be located so that snow or ice is not deposited in a manner that will obstruct means of egress from that doorway.

G4.4 Emergency lighting

In a Class 2, 3, 5, 6, 7, 8 or 9 building or Class 4 part of a building, a system of emergency lighting must be installed in accordance with the *Deemed-to-Satisfy Provisions* of **Part E4**—

Deemed-to-Satisfy Provisions

(a) in every stairway (other than those within a *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part of a building); and

(b) in every *public corridor* or the like leading to an *exit*; and

(c) externally above every doorway opening to a road or *open space*; and

(d) in any *storey* of the building if illumination sufficient for safe egress will not be available under conditions of emergency.

G4.5 External ramps

An external ramp serving as an *exit* must—

(a) where a ramp is also serving as an *accessible* ramp under **Part D3**, be in accordance with AS 1428.1; or

(b) in any other case, have a gradient not steeper than 1:12.

G4.6 Discharge of exits

A building in an *alpine area* must be so constructed that—

(a) if any part of an *external wall* is more than 3.6 m above the natural ground level — the distance of that part from a boundary other than a road alignment is not less than 2.5 m plus 100 mm for each 300 mm or part by which that part of the wall exceeds a height of 3.6 m; and

(b) if an *exit* doorway discharges into a court between wings of a building — the wings are not less than 6 m apart; and

(c) if an *exit* doorway is opposite a barrier which is more than 900 mm above the threshold of the doorway — the threshold is at a distance from that barrier of not less than twice the height of the barrier or 6 m, whichever is the lesser.

G4.7 External trafficable structures

External stairways, ramps, access bridges or other trafficable structures must have—

(a) a floor surface that consists of steel mesh or other suitable material if it is used as a means of egress; and

(b) any *required* balustrade or other barrier constructed so that its sides are not less than 75% open.

G4.8 Fire-fighting services and equipment

Every Class 2, 3, 5, 6, 7, 8 and 9 building must have—

(a) a manually operated fire alarm system with call-points complying with AS 1670.1; and

(b) fire hose reels and fire hydrants installed in accordance with the *Deemed-to-Satisfy Provisions* of **Part E1**.

Deemed-to-Satisfy Provisions

G4.9 Fire orders

Every Class 2, 3 or 9 building must display a notice clearly marked "FIRE ORDERS" in suitable locations near the main entrance and on each *storey*, explaining—

(a) the method of operation of the fire alarm system and the location of all call-points; and

(b) the location and methods of operation of all fire-fighting equipment; and

(c) the location of all *exits*; and

(d) the procedure for evacuation of the building.

PART G5 CONSTRUCTION IN BUSHFIRE PRONE AREAS

OBJECTIVE

NSW GO5

Qld GO5

Tas GO5

GO5

The *Objective* of this Part is to—

(a) safeguard occupants from injury; and

(b) protect buildings,

from the effects of a bushfire.

Application

GO5 only applies to—

(a) a Class 2 or 3 building; or

(b) a Class 10a building or deck associated with a Class 2 or 3 building,

located in a *designated bushfire prone area*.

FUNCTIONAL STATEMENT

NSW GF5.1

Qld GF5.1

Tas GF5.1

GF5.1

A building constructed in a *designated bushfire prone area* is to provide a resistance to bushfires in order to reduce the danger to life and minimise the risk of the loss of the building.

Application

GF5.1 only applies to—

(a) a Class 2 or 3 building; or

(b) a Class 10a building or deck associated with a Class 2 or 3 building,

located in a *designated bushfire prone area*.

PERFORMANCE REQUIREMENT

NSW GP5.1

Qld GP5.1

Tas GP5.1

GP5.1

A building that is constructed in a *designated bushfire prone area* must, to the degree necessary, be designed and constructed to reduce the risk of ignition from a bushfire, appropriate to the—

(a) potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and

(b) intensity of the bushfire attack on the building.

Application

GP5.1 only applies to—

(a) a Class 2 or 3 building; or

(b) a Class 10a building or deck associated with a Class 2 or 3 building,

located in a *designated bushfire prone area*.

PART G5 CONSTRUCTION IN BUSHFIRE PRONE AREAS

Deemed-to-Satisfy Provisions

G5.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **GP5.1** is satisfied by complying with **G5.1** and **G5.2**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **G5.1** and **G5.2**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

G5.1 Application of Part

SA G5.1

Qld G5.1

The *Deemed-to-Satisfy Provisions* of this Part apply to—

(a) a Class 2 or 3 building; or

(b) a Class 10a building or deck associated with a Class 2 or 3 building,

located in a *designated bushfire prone area*.

G5.2 Protection

NSW G5.2

SA G5.2

In a *designated bushfire prone area*—

(a) a Class 2 or 3 building; or

(b) a Class 10a building or deck associated with a Class 2 or 3 building,

must comply with AS 3959.

SA G5.3

Tas G5.3 and Tas G5.4

SECTION H

SPECIAL USE BUILDINGS

SECTION H CONTENTS

PART H1 THEATRES, STAGES AND PUBLIC HALLS

Deemed-to-Satisfy Provisions

Note.

Part H1 contains *Deemed-to-Satisfy Provisions* additional to those contained in Sections **C**, **D** and **E** for buildings containing theatres, stages and public halls.

H1.1 Application of Part

NSW H1.1

(a) The *Deemed-to-Satisfy Provisions* of this Part apply to every enclosed Class 9b building or part of a building which—

(i) is a *school* assembly, church or community hall with a *stage* and any *backstage* area with a total *floor area* of more than 300 m^2; or

(ii) otherwise, has a *stage* and any *backstage* area with a total *floor area* of more than 200 m^2; or

(iii) has a *stage* with an associated rigging loft.

(b) Notwithstanding **(a)**—

(i) **H1.4** applies to every open or enclosed Class 9b building; and

(ii) **H1.7** applies to every enclosed Class 9b building.

H1.2 Separation

A theatre, public hall or the like must—

(a) have a sprinkler system complying with **Specification E1.5**; or

(b) have the *stage*, *backstage* area and accessible under-*stage* area separated from the audience by a proscenium wall in accordance with **H1.3**.

H1.3 Proscenium wall construction

A proscenium wall must comply with **Specification H1.3**.

H1.4 Seating area

In a seating area—

(a) the gradient of the floor surface must not be steeper than 1 in 8, or the floor must be stepped so that—

(i) a line joining the nosings of consecutive steps does not exceed an angle of 30° to the horizontal; and

(ii) the height of each step in the stepped floor is not more than 600 mm; and

(iii) the height of any opening in such a step is not more than 125 mm; and

(b) if an aisle divides the stepped floor and the difference in level between any 2 consecutive steps—

(i) exceeds 230 mm but not 400 mm — an intermediate step must be provided in the aisle; and

(ii) exceeds 400 mm — 2 equally spaced intermediate steps must be provided in the aisle; and

(iii) the going of intermediate steps must be not less than 270 mm and such as to provide as nearly as practicable equal treads throughout the length of the aisle; and

(c) the clearance between rows of fixed seats used for viewing performing arts, sport or recreational activities must be not less than—

(i) 300 mm if the distance to an aisle is not more than 3.5 m; or

(ii) 500 mm if the distance to an aisle is more than 3.5 m.

H1.5 Exits from theatre stages

(a) The path of travel to an *exit* from a *stage* or performing area must not pass through the proscenium wall if the *stage* area is separated from the audience area with a proscenium wall.

(b) *Required exits* from *backstage* and under-*stage* areas must be independent of those provided for the audience area.

H1.6 Access to platforms and lofts

A stairway that provides access to a service platform, rigging loft, or the like, must comply with AS 1657.

H1.7 Aisle lights in theatres

In every enclosed Class 9b building, where in any part of the auditorium, the general lighting is dimmed or extinguished during public occupation and the floor is stepped or is inclined at a slope steeper than 1 in 12, aisle lights must be provided to illuminate the full length of the aisle and tread of each step.

PART H2 PUBLIC TRANSPORT BUILDINGS

Note.

Part H2 contains *Deemed-to-Satisfy Provisions* for Class 9b and Class 10 public transport buildings additional to those contained in **Parts D3**, **E3** and **F2** that apply to public transport buildings.

Deemed-to-Satisfy Provisions

H2.1 Application of Part

(a) The *Deemed-to-Satisfy Provisions* of this Part apply to the passenger use areas of a Class 9b or Class 10 building used for public transport.

(b) The *Deemed-to-Satisfy Provisions* of this Part take precedence where there is a difference to the *Deemed-to-Satisfy Provisions* of **Parts D3**, **E3** and **F2**.

(c) For an airport that does not accept regular public transport services, as defined in the Disability Standards for Accessible Public Transport 2002, only **H2.8**, **H2.9**, **H2.10**, **H2.11**, **H2.12** and **H2.13** of this Part apply.

(d) **A3.3(a)(i)** does not apply to this Part.

H2.2 Accessways

(a) An *accessway* must comply with AS 1428.2.

(b) If an *accessway* branches into 2 or more parallel tracks—

  (i) the ends of each track must be on the main pedestrian traffic routes; and

  (ii) the parallel tracks must have equal convenience and be located as close as practicable to the main pedestrian branch.

(c) The minimum unobstructed width of an *accessway* must be 1.2 m, except that—

  (i) the minimum unobstructed width of a moving walkway forming part of an *accessway* may be not less than 850 mm; and

  (ii) the minimum unobstructed width of a doorway in an *accessway* may be not less than 850 mm.

(d) Poles, columns, stanchions, bollards and fixtures must not project into an *accessway*.

(e) Obstacles that abut an *accessway* must have a *luminance contrast* with a background of not less than 30%.

(f) Manoeuvring areas that allow a 180 degree wheelchair turn must comply with clause 6.2 of AS 1428.2.

(g) A passing area must be provided at least every 6 m along any two-way *accessway* that is less than 1 800 mm wide.

(h) Ground and floor surfaces must comply with clause 9 of AS 1428.2 and AS 1428.1 Supplement 1 provides criteria for the selection of floor surfaces.

Deemed-to-Satisfy Provisions

(i) The requirements of **D3.3(c)(ii)** do not apply to Class 9b or Class 10 public transport buildings.

H2.3 Ramps

(a) A ramp forming part of an *accessway* must comply with clause 8 of AS 1428.2.

(b) The requirements of **D3.11(a)** do not apply to Class 9b or Class 10 public transport buildings.

H2.4 Handrails and grabrails

(a) A handrail must comply with clause 10.1 of AS 1428.2.

(b) Handrails must be placed along an *accessway* wherever passengers are likely to require additional support or passive guidance.

(c) A grabrail must comply with clause 10.2 of AS 1428.2.

(d) A grabrail or handrail must be provided at fixed locations where passengers are required to pay fares.

H2.5 Doorways and doors

Doorways and doors must comply with clause 11 (except clause 11.5.2) of AS 1428.2.

H2.6 Lifts

Lift facilities must comply with AS 1735.12.

H2.7 Stairways

Stairs must comply with—

(a) clause 9.1 of AS 1428.1, including the notes; and

(b) clause 9.2 of AS 1428.1; and

(c) clause 13.2, 13.3 and Figures 8 and 9 of AS 1428.2.

H2.8 Unisex accessible toilet

If toilets are provided, there must be at least one unisex *accessible* toilet without an airlock that complies with AS 1428.1 clause 10, sanitary facilities.

H2.9 Location of accessible toilets

Accessible toilets must be in the same location as other toilets.

H2.10 Symbols and signs

(a) The international symbols for accessibility and deafness in accordance with clauses 14.2 and 14.3 of AS 1428.1 must be used to identify an *accessway* and which facilities and boarding points are *accessible*.

(b) Signs must be placed in accordance with clause 17.4 of AS 1428.2.

(c) The size of accessibility symbols must comply with Table 1 of AS 1428.2.

(d) The symbol for accessibility must incorporate directional arrows and words or, if possible, pictograms, to show passengers the way to *accessible* facilities such as toilets.

(e) Signs must comply with clause 17.1 and Figure 30 of AS 1428.2.

(f) If a sign incorporates raised lettering or symbols, they must be at least 0.8 mm above the surface of the sign.

(g) If an operator or provider supplements a notice with braille characters, they must be placed to the left of the raised characters.

H2.11 Tactile ground surface indicators

Tactile ground surface indicators must be installed in accordance with AS 1428.4 on an *accessway* and must indicate changes of direction in accordance with clause 18.1 of AS 1428.2.

H2.12 Lighting

Any lighting provided must comply with minimum levels of maintenance illumination for various situations shown in the notes to clause 19.1 of AS 1428.2.

H2.13 Hearing augmentation

If a public address system is installed, it must comply with clause 21.1 of AS 1428.2.

H2.14 Emergency warning systems

(a) If an emergency warning system is installed, it must comply with clause 18.2.1, 18.2.2 and 18.2.3 of AS 1428.2.

(b) In the event of an emergency, provision must be made for people with vision impairment to locate the *exit* path.

H2.15 Controls

Controls must comply with clause 11 of AS 1428.1.

SPECIFICATION H1.3 CONSTRUCTION OF THEATRES WITH PROSCENIUM WALLS

Deemed-to-Satisfy Provisions

1. Scope

This Specification contains the requirements for the construction of proscenium walls for theatres, public halls, or the like.

2. Separation of stage areas, etc

(a) Dressing rooms, scene docks, property rooms, workshops, associated store rooms and other ancillary areas must be—

(i) located on the *stage* side of the proscenium wall; and

(ii) separated from corridors and the like by construction having an FRL of not less than 60/60/60, and if of *lightweight construction*, complying with **Specification C1.8**.

(b) The *stage* and *backstage* must be separated from other parts of the building other than the audience seating area by construction having an FRL of not less than 60/60/60, and if of *lightweight construction*, complying with **Specification C1.8**.

(c) Any doorway in the construction referred to in paragraphs **(a)** and **(b)** must be protected by a *self-closing* - /60/30 fire door.

3. Proscenium wall construction

A proscenium wall must—

(a) extend to the underside of the roof covering or the underside of the structural floor next above; and

(b) have an FRL of not less than 60/60/60, and if of *lightweight construction*, comply with **Specification C1.8**.

4. Combustible materials not to cross proscenium wall

Timber purlins or other *combustible* material must not pass through or cross any proscenium wall.

5. Protection of openings in proscenium wall

Every opening in a proscenium wall must be protected—

(a) at the principal opening, by a curtain in accordance with **Clause 6** which is—

(i) capable of closing the proscenium opening within 35 seconds either by gravity slide or motor assisted mechanisms; and

(ii) operated by a system of *automatic* heat activated devices, manually operated devices or push button emergency devices; and

(iii) able to be operated from either the *stage* side or the audience side of the curtain; and

(b) at any doorway in the wall, by a *self-closing* - /60/30 fire door.

6. Proscenium curtains

A curtain *required* by **Clause 5** must be—

(a) a fire safety curtain—

(i) made of *non-combustible* material; and

(ii) capable of withstanding a pressure differential of 0.5 kPa over its entire surface area; and

(iii) so fitted that when fully lowered it inhibits the penetration of smoke around the perimeter of the opening, from the *stage*; or

(b) a curtain—

(i) having *fire hazard properties* complying with **Specification C1.10**; and

(ii) protected by a deluge system of open sprinklers installed along the full width of the curtain.

SECTION I

MAINTENANCE

SECTION I CONTENTS

PART I1 EQUIPMENT AND SAFETY INSTALLATIONS

OBJECTIVE

IO1

The *Objective* of this Part is to ensure that people are protected from illness, injury and loss of amenity throughout the life of the building.

FUNCTIONAL STATEMENT

IF1.1

Equipment and safety installations in a building are to safeguard people from illness or injury and prevent the loss of amenity.

PERFORMANCE REQUIREMENT

IP1.1

Safety measures must be capable of performing to a standard no less than that which they were originally *required* to achieve.

IP1.2

Mechanical ventilation and hot water, warm water and cooling water systems must be adequately maintained to safeguard people from illness or injury.

PART I1 EQUIPMENT AND SAFETY INSTALLATIONS

Deemed-to-Satisfy Provisions

I1.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*—

(i) *Performance Requirement* **IP1.1** is satisfied by complying with **I1.1**; and

(ii) *Performance Requirement* **IP1.2** is satisfied by complying with **I1.2**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **I1.1** to **I1.2**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

I1.1 Safety measures

NSW I1.1

NT I1.1

SA I1.1

Safety measures must—

(a) perform to a standard not less than they were originally *required* to achieve; and

(b) for those safety measures listed in Tables I1.1 to I1.13, perform to a standard not less than that determined using the corresponding BCA provisions.

Table I1.1 SAFETY MEASURES - BUILDING FIRE INTEGRITY

Safety measure	BCA provisions for determining standard of performance
Building elements *required* to satisfy prescribed *fire-resistance levels*	Section C
	D1.12
Materials and assemblies *required* to have *fire hazard properties*	C1.10
Elements *required* to be *non-combustible*, provide fire protection, compartmentation or separation	C2.5 to C2.14, C3.3, C3.11
	D1.7, D1.8
	E1.3
	G3.4
Wall-wetting sprinklers (including doors and windows *required* in conjunction with wall-wetting sprinklers)	C3.4, C3.8, C3.11
	D1.7, D1.8
	G3.8

Deemed-to-Satisfy Provisions

Table I1.1 SAFETY MEASURES - BUILDING FIRE INTEGRITY (Continued)

Safety measure	BCA provisions for determining standard of performance
Fire doors (including sliding fire doors and their associated warning systems) and associated *self-closing*, *automatic* closing and latching mechanisms	C2.12, C2.13, C3.4 to C3.8, C3.10, C3.11
	D1.7, D1.8, D1.12
Fire windows (including windows that are *automatic* or permanently fixed in the closed position)	C3.4, C3.8, C3.11
	D1.7, D1.8
Fire shutters	C3.4, C3.5
	D1.7, D1.8
Solid core doors and associated *self-closing*, *automatic* closing and latching mechanisms	C3.11
Fire protection at service penetrations through elements *required* to be *fire-resisting* with respect to *integrity* or *insulation*, or to have a *resistance to the incipient spread of fire*	C3.12, C3.13, C3.15
Fire protection associated with construction joints, spaces and the like in and between building elements *required* to be *fire-resisting* with respect to *integrity* and *insulation*	C3.16
Smoke doors and associated *self-closing*, *automatic* closing and latching mechanisms	Specification C2.5
	D2.6
Proscenium walls (including proscenium curtains)	H1.3

Table I1.2 SAFETY MEASURES - MEANS OF EGRESS

Safety measure	BCA provisions for determining standard of performance
Paths of travel to *exits*	D1.6
Discharge from *exits* (including paths of travel from *open spaces* to the public roads to which they are connected)	D1.7, D1.9 to D1.11, D2.12
	G4.3, G4.6, G4.7
Exits (including *fire-isolated stairways* and ramps, non-*fire-isolated stairways* and ramps, stair treads, balustrades and handrails associated with *exits*, and *fire-isolated passageways*)	D2.2, D2.3, D2.8 to D2.11, D2.13, D2.16, D2.17
Smoke lobbies to fire-isolated *exits*	D1.7, D2.6
Open access ramps or balconies for fire-isolated *exits*	D2.19 to D2.23

Deemed-to-Satisfy Provisions

Table I1.2 SAFETY MEASURES - MEANS OF EGRESS (Continued)

Safety measure	BCA provisions for determining standard of performance
Doors (other than fire or smoke doors) in a *required exit*, forming part of a *required exit* or in a path of travel to a *required exit*, and associated *self-closing*, *automatic* closing and latching mechanisms	D1.6, D2.19 to D2.21, D2.23

Table I1.3 SAFETY MEASURES - SIGNS

Safety measure	BCA provisions for determining standard of performance
Exit signs (including direction signs)	Specification D1.12
	E4.5, E4.6, E4.8
Signs warning against the use of lifts in the event of fire	E3.3
Warning signs on sliding fire doors and doors to non-*required* stairways, ramps and escalators	C3.6
	Specification D1.12
Signs, intercommunication systems, or alarm systems on doors of fire-isolated *exits* stating that re-entry to a *storey* is available	D2.22
Signs alerting persons that operation of doors must not be impaired	D2.23
Signs *required* on doors, in *alpine areas*, alerting people that they open inwards	G4.3
Fire order notices *required* in *alpine areas*	G4.9

Table I1.4 SAFETY MEASURES - LIGHTING

Safety measure	BCA provisions for determining standard of performance
Emergency lighting	E4.2, E4.4
Artificial lighting *required* to assist occupant movement and egress	F4.4, H1.7

Table I1.5 SAFETY MEASURES - FIRE FIGHTING SERVICES AND EQUIPMENT

Safety measure	BCA provisions for determining standard of performance
Fire hydrant system (including on-site pump set and fire-service booster connection)	E1.3
Fire hose reel system	E1.4

Deemed-to-Satisfy Provisions

Table I1.5 SAFETY MEASURES - FIRE FIGHTING SERVICES AND EQUIPMENT (Continued)

Safety measure	BCA provisions for determining standard of performance
Sprinkler system	E1.5
	G3.8
	H1.2
Portable fire extinguishers	E1.6
Fire control centres (or rooms)	E1.8
Provisions for special hazards	E1.10

Table I1.6 SAFETY MEASURES - AIR HANDLING SYSTEMS

Safety measure		BCA provisions for determining standard of performance
Smoke hazard management systems—		E2.2
•	*automatic* air pressurisation systems for fire-isolated *exits*	
•	zone smoke control system	
•	*automatic* smoke exhaust system	
•	*automatic smoke-and-heat vents*	
•	air-handling systems that do not form part of smoke hazard management system and which may unduly contribute to the spread of smoke	
•	miscellaneous air-handling systems covered by Sections 5 and 11 of AS/NZS 1668.1 serving more than one *fire compartment*	
•	other air-handling systems	
Carpark mechanical ventilation system		F4.11
Atrium smoke control system		Specification G3.8

Table I1.7 SAFETY MEASURES - AUTOMATIC FIRE DETECTION AND ALARM SYSTEMS

Safety measure	BCA provisions for determining standard of performance
Smoke and heat alarm system	Clause 3 of Specification E2.2a
Smoke and heat detection system	Clause 4 of Specification E2.2a
Atrium fire detection and alarm systems	Clause 4 of Specification G3.8

Deemed-to-Satisfy Provisions

Table I1.8 SAFETY MEASURES - OCCUPANT WARNING SYSTEMS

Safety measure	BCA provisions for determining standard of performance
Sound system and intercom system for emergency purposes	E4.9
	Clause 5 of Specification G3.8
Building occupant warning system	Clause 8 of Specification E1.5
	Clause 6 of Specification E2.2a

Table I1.9 SAFETY MEASURES - LIFTS

Safety measure	BCA provisions for determining standard of performance
Stretcher facilities in lifts	E3.2
Emergency lifts	E3.4
Passenger lift fire service controls	E3.7

Table I1.10 SAFETY MEASURES - STANDBY POWER SUPPLY SYSTEMS

Safety measure	BCA provisions for determining standard of performance
Standby power supply system	E3.4
	Clause 6 of Specification G3.8

Table I1.11 SAFETY MEASURES - BUILDING CLEARANCE AND FIRE APPLIANCES

Safety measure	BCA provisions for determining standard of performance
Open space around large isolated buildings	C2.3, C2.4
Vehicular access around large isolated buildings	C2.3, C2.4

Table I1.12 SAFETY MEASURES - OTHER MEASURES

Safety measure	BCA provisions for determining standard of performance
Glazed assemblies	B1.4
	F1.13
Balconies	Part B1
Balustrades	Part B1
	D2.16
Swimming pool safety fencing	G1.1
Refrigerated chambers, strong rooms and vaults	G1.2

Deemed-to-Satisfy Provisions

Table I1.12 SAFETY MEASURES - OTHER MEASURES (Continued)

Safety measure	BCA provisions for determining standard of performance
Bushfire protection measures	G5.2

Table I1.13 SAFETY MEASURES - BUILDING USE AND APPLICATION

Safety measure	BCA provisions for determining standard of performance
Classification and use of building	A3.2 to A3.4
Occupancy hazard	E1.5, E1.6, E1.10

I1.2 Mechanical ventilation and hot water, warm water and cooling water systems

NSW I1.2

SA I1.2

Mechanical ventilation and hot water, warm water and cooling water systems in a building other than a system only serving a single *sole-occupancy unit* in a Class 2 or 3 building or Class 4 part must be maintained in accordance with AS/NZS 3666.2.

PART I2 ENERGY EFFICIENCY INSTALLATIONS

NSW Part I2

NT Part I2

Tas Part I2

OBJECTIVE

IO2

The *Objective* of this Part is to reduce greenhouse gas emissions by efficiently using energy throughout the life of the building.

Limitation:

IO2 does not apply to a *sole-occupancy unit* in a Class 2 building, or a Class 4 part of a building.

FUNCTIONAL STATEMENT

IF2.1

A building's *services* are to be continually capable of using energy efficiently.

Limitation:

IF2.1 does not apply to a *sole-occupancy unit* in a Class 2 building, or a Class 4 part of a building.

PERFORMANCE REQUIREMENT

IP2.1

A building's *services* must continue to perform to a standard of energy efficiency no less than that which they were originally *required* to achieve.

Limitation:

IP2.1 does not apply to *services* serving only one *sole-occupancy unit* in a Class 2 building, or serving only a Class 4 part of a building.

PART I2 ENERGY EFFICIENCY INSTALLATIONS

Deemed-to-Satisfy Provisions

NSW Part I2

NT Part I2

Tas Part I2

I2.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirement* **IP2.1** is satisfied by complying with **I2.1** to **I2.2**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **I2.1** to **I2.2**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

I2.1 Application of Part

The *Deemed-to-Satisfy Provisions* of this Part do not apply to *services* serving only one *sole-occupancy unit* of a Class 2 building or serving a Class 4 part of a building.

I2.2 Components of services

Components of *services* must be maintained to ensure that they perform to a standard not less than they were originally *required* to achieve, including—

(a) adjustable or motorised shading devices; and

(b) time switches and motion detectors; and

(c) room temperature thermostats; and

(d) plant thermostats such as on boilers or refrigeration units; and

(e) motorised air dampers and control valves; and

(f) reflectors, lenses and diffusers of light fittings; and

(g) heat transfer equipment; and

(h) plant that receives a concession under **JV3(b)** for the use of energy obtained from—

  (i) an on-site *renewable energy* source; or

  (ii) another process as reclaimed energy.

SECTION J

ENERGY EFFICIENCY

SECTION J CONTENTS

SECTION J ENERGY EFFICIENCY

NSW Section J

NT Section J

Qld Section J

Tas Section J

OBJECTIVE

JO1

The *Objective* of this Section is to reduce greenhouse gas emissions.

FUNCTIONAL STATEMENT

JF1

To reduce greenhouse gas emissions. to the degree necessary—

(a) a building, including its *services*, is to be capable of efficiently using energy; and

(b) a building's *services* for heating are to obtain their energy from—

(i) a low greenhouse gas intensity source; or

(ii) an on-site *renewable energy* source; or

(iii) another process as reclaimed energy.

PERFORMANCE REQUIREMENTS

JP1

A building, including its *services*, must have, to the degree necessary, features that facilitate the efficient use of energy appropriate to—

(a) the function and use of the building and *services*; and

(b) the internal environment; and

(c) the geographic location of the building; and

(d) the effects of nearby permanent features such as topography, structures and buildings; and

(e) solar radiation being—

(i) utilised for heating; and

(ii) controlled to minimise energy for cooling; and

(f) the sealing of the building *envelope* against air leakage; and

(g) the utilisation of air movement to assist heating and cooling; and

(h) the energy source of the *services*.

JP2

A building, including its *services*, must have, to the degree necessary, features that facilitate the maintenance of systems and components appropriate to the function and use of the building.

Limitation:

JP2 does not apply to *services* serving only one *sole-occupancy unit* in a Class 2 building or serving a Class 4 part of a building.

JP3

Heating such as for a *conditioned space* must, to the degree necessary, obtain energy from—

(a) a source that has a greenhouse gas intensity that does not exceed 100 g CO_2-e/MJ of thermal energy load; or

(b) an on-site *renewable energy* source; or

(c) another process as reclaimed energy.

SA JP4

VERIFICATION METHODS

JV1 * * * * *

This clause has deliberately been left blank.

JV2 * * * * *

This clause has deliberately been left blank.

JV3 Verification using a reference building

(a) For a Class 3, 5, 6, 7, 8 and 9 building, compliance with **JP1** is verified when it is determined that the *annual energy consumption* of the proposed building with its

services is not more than the *annual energy consumption* of a *reference building* when—

(i) the proposed building is modelled with the proposed *services*; and

(ii) the proposed building is modelled with the same *services* as the *reference building*.

(b) The *annual energy consumption* of the proposed building in **(a)** may be reduced by the amount of energy obtained from—

(i) an on-site *renewable energy* source; or

(ii) another process as reclaimed energy.

(c) The *annual energy consumption* calculation method must comply with the ABCB Protocol for Building Energy Analysis Software.

(d) The *annual energy consumption* in **(a)** must be calculated—

(i) for the *reference building*, using—

(A) the *Deemed-to-Satisfy Provisions* for **Parts J1** to **J7** but including only the minimum amount of mechanical ventilation *required* by **Part F4**; and

(B) a solar absorptance of 0.6 for *external walls* and 0.7 for roofs; and

(C) the maximum *illumination power density* without any increase for a control device *illumination power density* adjustment factor; and

(D) *air-conditioning* with the *conditioned space* temperature within the range of 18° CDB to 26° CDB for 98% of the plant operation time; and

(E) the profiles for occupancy, *air-conditioning*, lighting and internal heat gains from people, hot meals, appliances, equipment and hot water supply systems—

(aa) of the actual building—

(AA) if the operating hours per year are not less than 2 500; or

(BB) if the daily operating profiles are not listed in **Specification JV**; or

(bb) of **Specification JV**; and

(F) infiltration values—

(aa) for a perimeter zone of depth equal to the floor-to-ceiling height, when pressurising plant is operating, 1.0 air change per hour; and

(bb) for the whole building, when pressurising plant is not operating, 1.5 air change per hour; and

(ii) for both the proposed building and the *reference building* using the same—

(A) *annual energy consumption* calculation method; and

(B) location, being either the location where the building is to be constructed if appropriate climatic data is available, or the nearest

location with similar climatic conditions, for which climatic data is available; and

(C) adjacent structures and features; and

(D) environmental conditions such as ground reflectivity, sky and ground form factors, temperature of external bounding surfaces, air velocities across external surfaces and the like; and

(E) orientation; and

(F) building form, including—

(aa) the roof geometry; and

(bb) the floor plan; and

(cc) the number of *storeys*; and

(dd) the ground to lowest floor arrangements; and

(ee) the size and location of *glazing*; and

(G) external doors; and

(H) testing standards including for insulation, *glazing*, water heater and package *air-conditioning* equipment; and

(I) thermal resistance of air films including any adjustment factors, moisture content of materials and the like; and

(J) dimensions of external, internal and separating walls; and

(K) surface density of *envelope* walls over 220 kg/m^2, and

(L) quality of insulation installation; and

(M) assumptions and means of calculating the temperature difference across *air-conditioning* zone boundaries; and

(N) floor coverings and furniture and fittings density; and

(O) internal shading devices, their colour and their criteria for operation; and

(P) number, sizes and floors served by lifts and escalators; and

(Q) range and type of *services* and energy sources other than energy generated on-site from sources that do not emit greenhouse gases such as solar and wind power; and

(R) internal artificial lighting levels; and

(S) internal heat gains including people, lighting, appliances, meals and other electric power loads; and

(T) *air-conditioning* system configuration and zones; and

(U) daily and annual profiles of the—

(aa) building occupancy; and

(bb) operation of *services*; and

(V) range of internal temperatures and plant operating times; and

(W) supply hot water temperature and rate of use; and

(X) infiltration values unless there are specific additional sealing provisions or pressure testing to be undertaken; and

(Y) unit capacity and sequencing for water heaters, refrigeration chillers and heat rejection equipment such as cooling towers; and

(Z) metabolic rate for people; and

(iii) for the proposed building using a solar absorptance for the roof and walls 0.05 higher than that proposed; and

(e) Where the *annual energy consumption* of the hot water supply or the lifts and escalators are the same in the proposed building and the *reference building*, they may be omitted from the calculation of both the proposed building and the *reference building*.

(f) A lift in a building with more than one classification may be proportioned according to the number of *storeys* of the part for which the *annual energy consumption* is being calculated.

(g) The design must include—

(i) the ability to achieve all the criteria used in the *annual energy consumption* calculation method such as having an automatic operation controlling device capable of turning lighting, and *air-conditioning* plant on and off in accordance with the occupancy and operating profiles used; and

(ii) compliance with—

(A) **J1.2** for general thermal construction; and

(B) **J1.3(c)** for compensation for a loss of ceiling insulation; and

(C) **J1.6(a)(ii)**, **J1.6(c)** and **J1.6(d)** for floor edge insulation; and

(D) BS 7190 for testing a water heater; and

(E) AS/NZS 3823.1.2 at test condition T1 for testing package *air-conditioning* equipment; and

(F) AHRI 550/590 for testing a refrigeration chiller.

SA JV4

SPECIFICATION JV ANNUAL ENERGY CONSUMPTION CRITERIA

1. Scope

This Specification contains the requirements for calculating the *annual energy consumption* of *services* in a building.

2. Annual energy consumption of services

The *annual energy consumption*—

(a) for *air-conditioning*, must be calculated on the basis of—

(i) the daily occupancy and operation profiles in **Tables 2a** to **2g**; and

(ii) plant serving public areas of a Class 3 or Class 9c *aged care building* being available on thermostatic control 24 hours per day; and

(iii) the internal heat gains in a building—

(A) from the occupants, at an average rate of 75 W per person *sensible heat gain* and 55 W per person *latent heat gain*, with the number of people calculated in accordance with **D1.13**; and

(B) from hot meals in a dining room, restaurant or cafe, at a rate of 5 W per person *sensible heat gain* and 25 W per person *latent heat gain* with the number of people calculated in accordance with **D1.13**; and

(C) from appliances and equipment, in accordance with **Table 2h**; and

(D) from artificial lighting, that is calculated in **(b)**; and

(b) for artificial lighting, must be calculated on the basis of the proposed level of artificial lighting in the building with the daily profile in **Tables 2a** to **2g**.

Table 2a OCCUPANCY AND OPERATION PROFILES OF A CLASS 3 BUILDING OR CLASS 9c AGED CARE BUILDING

Time period (local standard time)	Occupancy		Artificial lighting	*Air-conditioning*	
	Monday to Friday	Saturday, Sunday and holidays		Monday to Friday	Saturday, Sunday and holidays
12:00am to 1:00am	85%	85%	5%	On	On
1:00am to 2:00am	85%	85%	5%	On	On
2:00am to 3:00am	85%	85%	5%	On	On
3:00am to 4:00am	85%	85%	5%	On	On
4:00am to 5:00am	85%	85%	5%	On	On
5:00am to 6:00am	85%	85%	25%	On	On

Table 2a OCCUPANCY AND OPERATION PROFILES OF A CLASS 3 BUILDING OR CLASS 9c AGED CARE BUILDING (Continued)

Time period (local standard time)	Occupancy		Artificial lighting	*Air-conditioning*	
	Monday to Friday	Saturday, Sunday and holidays		Monday to Friday	Saturday, Sunday and holidays
6:00am to 7:00am	85%	85%	80%	On	On
7:00am to 8:00am	80%	85%	80%	On	On
8:00am to 9:00am	50%	50%	50%	On	On
9:00am to 10:00am	10%	50%	20%	Off	On
10:00am to 11:00am	10%	20%	20%	Off	Off
11:00am to 12:00pm	10%	20%	20%	Off	Off
12:00pm to 1:00pm	10%	20%	20%	Off	Off
1:00pm to 2:00pm	10%	20%	20%	Off	Off
2:00pm to 3:00pm	10%	20%	20%	Off	Off
3:00pm to 4:00pm	10%	30%	20%	Off	Off
4:00pm to 5:00pm	50%	50%	20%	On	On
5:00pm to 6:00pm	50%	50%	50%	On	On
6:00pm to 7:00pm	70%	50%	50%	On	On
7:00pm to 8:00pm	70%	70%	50%	On	On
8:00pm to 9:00pm	80%	80%	50%	On	On
9:00pm to 10:00pm	85%	80%	50%	On	On
10:00pm to 11:00pm	85%	85%	50%	On	On
11:00pm to 12:00am	85%	85%	5%	On	On

Note:

The occupancy profile is expressed as a percentage of the maximum number of people that can be accommodated in the Class 3 building or Class 9c *aged care building*. The artificial lighting profile is expressed as a percentage of the maximum *illumination power density* permitted under **Part J6**.

Table 2b OCCUPANCY AND OPERATION PROFILES OF A CLASS 5 BUILDING, A CLASS 8 LABORATORY OR A CLASS 9a CLINIC, DAY SURGERY OR PROCEDURE UNIT

Time period (local standard time)	Occupancy (Monday to Friday)	Artificial lighting (Monday to Friday)	Appliances and equipment (Monday to Friday)	*Air-conditioning* (Monday to Friday)
12:00am to 1:00am	0%	10%	10%	Off

Table 2b OCCUPANCY AND OPERATION PROFILES OF A CLASS 5 BUILDING, A CLASS 8 LABORATORY OR A CLASS 9a CLINIC, DAY SURGERY OR PROCEDURE UNIT (Continued)

Time period (local standard time)	Occupancy (Monday to Friday)	Artificial lighting (Monday to Friday)	Appliances and equipment (Monday to Friday)	*Air-conditioning* (Monday to Friday)
1:00am to 2:00am	0%	10%	10%	Off
2:00am to 3:00am	0%	10%	10%	Off
3:00am to 4:00am	0%	10%	10%	Off
4:00am to 5:00am	0%	10%	10%	Off
5:00am to 6:00am	0%	10%	10%	Off
6:00am to 7:00am	0%	10%	10%	Off
7:00am to 8:00am	15%	40%	25%	On
8:00am to 9:00am	60%	80%	70%	On
9:00am to 10:00am	100%	100%	100%	On
10:00am to 11:00am	100%	100%	100%	On
11:00am to 12:00pm	100%	100%	100%	On
12:00pm to 1:00pm	100%	100%	100%	On
1:00pm to 2:00pm	100%	100%	100%	On
2:00pm to 3:00pm	100%	100%	100%	On
3:00pm to 4:00pm	100%	100%	100%	On
4:00pm to 5:00pm	100%	100%	100%	On
5:00pm to 6:00pm	50%	80%	60%	On
6:00pm to 7:00pm	15%	60%	25%	Off
7:00pm to 8:00pm	5%	40%	15%	Off
8:00pm to 9:00pm	5%	20%	15%	Off
9:00pm to 10:00pm	0%	10%	10%	Off
10:00pm to 11:00pm	0%	10%	10%	Off
11:00pm to 12:00am	0%	10%	10%	Off

Notes:

1. The occupancy profile is expressed as a percentage of the maximum number of people that can be accommodated in the building. The artificial lighting profile is expressed as a percentage of the maximum *illumination power density* permitted under **Part J6**. The appliances and equipment profile is expressed as a percentage of the maximum internal heat gain in **Table 2h**. The *air-conditioning* profile is expressed as the plant status.

Table 2b OCCUPANCY AND OPERATION PROFILES OF A CLASS 5 BUILDING, A CLASS 8 LABORATORY OR A CLASS 9a CLINIC, DAY SURGERY OR PROCEDURE UNIT (Continued)

Time period (local standard time)	Occupancy (Monday to Friday)	Artificial lighting (Monday to Friday)	Appliances and equipment (Monday to Friday)	*Air-conditioning* (Monday to Friday)
2. Saturday and Sunday profiles are 10% continuous artificial lighting and 10% continuous appliances and equipment. There is no occupancy and the *air-conditioning* is "off".				

Table 2c OCCUPANCY AND OPERATION PROFILES OF A CLASS 6 SHOP OR SHOPPING CENTRE

Time period (local standard time)	Occupancy (Daily)	Artificial lighting (Daily)	Appliances and equipment (Daily)	*Air-conditioning* (Daily)
12:00am to 1:00am	0%	10%	10%	Off
1:00am to 2:00am	0%	10%	10%	Off
2:00am to 3:00am	0%	10%	10%	Off
3:00am to 4:00am	0%	10%	10%	Off
4:00am to 5:00am	0%	10%	10%	Off
5:00am to 6:00am	0%	10%	10%	Off
6:00am to 7:00am	0%	10%	10%	Off
7:00am to 8:00am	10%	100%	70%	On
8:00am to 9:00am	20%	100%	70%	On
9:00am to 10:00am	20%	100%	70%	On
10:00am to 11:00am	15%	100%	70%	On
11:00am to 12:00pm	25%	100%	70%	On
12:00pm to 1:00pm	25%	100%	70%	On
1:00pm to 2:00pm	15%	100%	70%	On
2:00pm to 3:00pm	15%	100%	70%	On
3:00pm to 4:00pm	15%	100%	70%	On
4:00pm to 5:00pm	15%	100%	70%	On
5:00pm to 6:00pm	5%	100%	70%	On
6:00pm to 7:00pm	5%	100%	70%	Off
7:00pm to 8:00pm	0%	10%	10%	Off

Table 2c OCCUPANCY AND OPERATION PROFILES OF A CLASS 6 SHOP OR SHOPPING CENTRE (Continued)

Time period (local standard time)	Occupancy (Daily)	Artificial lighting (Daily)	Appliances and equipment (Daily)	*Air-conditioning* (Daily)
8:00pm to 9:00pm	0%	10%	10%	Off
9:00pm to 10:00pm	0%	10%	10%	Off
10:00pm to 11:00pm	0%	10%	10%	Off
11:00pm to 12:00am	0%	10%	10%	Off

Note:

The occupancy profile is expressed as a percentage of the maximum number of people that can be accommodated in the building. The artificial lighting profile is expressed as a percentage of the maximum *illumination power density* permitted under **Part J6**. The appliances and equipment profile is expressed as a percentage of the maximum internal heat gain in **Table 2h**. The *air-conditioning* profile is expressed as the plant status.

Table 2d OCCUPANCY AND OPERATION PROFILES OF A CLASS 6 RESTAURANT OR CAFE

Time period (local standard time)	Occupancy (Monday to Saturday)	Artificial lighting (Monday to Saturday)	Appliances and equipment (Monday to Saturday)	*Air-conditioning* (Monday to Saturday)
12:00am to 1:00am	0%	5%	15%	Off
1:00am to 2:00am	0%	5%	15%	Off
2:00am to 3:00am	0%	5%	15%	Off
3:00am to 4:00am	0%	5%	15%	Off
4:00am to 5:00am	0%	5%	15%	Off
5:00am to 6:00am	0%	5%	15%	Off
6:00am to 7:00am	5%	40%	40%	Off
7:00am to 8:00am	5%	40%	40%	On
8:00am to 9:00am	5%	60%	60%	On
9:00am to 10:00am	5%	60%	60%	On
10:00am to 11:00am	20%	90%	90%	On
11:00am to 12:00pm	50%	90%	90%	On
12:00pm to 1:00pm	80%	90%	90%	On
1:00pm to 2:00pm	70%	90%	90%	On
2:00pm to 3:00pm	40%	90%	90%	On

Table 2d OCCUPANCY AND OPERATION PROFILES OF A CLASS 6 RESTAURANT OR CAFE (Continued)

Time period (local standard time)	Occupancy (Monday to Saturday)	Artificial lighting (Monday to Saturday)	Appliances and equipment (Monday to Saturday)	*Air-conditioning* (Monday to Saturday)
3:00pm to 4:00pm	20%	90%	90%	On
4:00pm to 5:00pm	25%	90%	90%	On
5:00pm to 6:00pm	50%	90%	90%	On
6:00pm to 7:00pm	80%	90%	90%	On
7:00pm to 8:00pm	80%	90%	90%	On
8:00pm to 9:00pm	80%	90%	90%	On
9:00pm to 10:00pm	50%	90%	90%	On
10:00pm to 11:00pm	35%	50%	50%	On
11:00pm to 12:00am	20%	30%	30%	On

Notes:

1. The occupancy profile is expressed as a percentage of the maximum number of people that can be accommodated in the building. The artificial lighting profile is expressed as a percentage of the maximum *illumination power density* permitted under **Part J6**. The appliances and equipment profile is expressed as a percentage of the maximum internal heat gain in **Table 2h**. The *air-conditioning* profile is expressed as the plant status.
2. Sunday profiles is 5% continuous artificial lighting and 5% continuous appliances and equipment. There is no occupancy and the *air-conditioning* is "off".

Table 2e OCCUPANCY AND OPERATION PROFILES OF A CLASS 9a WARD AREA

Time period (local standard time)	Occupancy		Artificial lighting	*Air-conditioning*	
	Monday to Friday	Saturday and Sunday		Monday to Friday	Saturday and Sunday
12:00am to 1:00am	85%	85%	5%	On	On
1:00am to 2:00am	85%	85%	5%	On	On
2:00am to 3:00am	85%	85%	5%	On	On
3:00am to 4:00am	85%	85%	5%	On	On
4:00am to 5:00am	85%	85%	5%	On	On
5:00am to 6:00am	85%	85%	25%	On	On
6:00am to 7:00am	85%	85%	80%	On	On
7:00am to 8:00am	85%	85%	80%	On	On

Table 2e OCCUPANCY AND OPERATION PROFILES OF A CLASS 9a WARD AREA (Continued)

Time period (local standard time)	Occupancy		Artificial lighting	*Air-conditioning*	
	Monday to Friday	Saturday and Sunday		Monday to Friday	Saturday and Sunday
8:00am to 9:00am	85%	85%	50%	On	On
9:00am to 10:00am	85%	85%	20%	On	On
10:00am to 11:00am	85%	85%	20%	On	On
11:00am to 12:00pm	85%	85%	20%	On	On
12:00pm to 1:00pm	85%	85%	20%	On	On
1:00pm to 2:00pm	85%	85%	20%	On	On
2:00pm to 3:00pm	85%	85%	20%	On	On
3:00pm to 4:00pm	85%	85%	20%	On	On
4:00pm to 5:00pm	85%	85%	20%	On	On
5:00pm to 6:00pm	85%	85%	50%	On	On
6:00pm to 7:00pm	85%	85%	50%	On	On
7:00pm to 8:00pm	85%	85%	50%	On	On
8:00pm to 9:00pm	85%	85%	50%	On	On
9:00pm to 10:00pm	85%	85%	50%	On	On
10:00pm to 11:00pm	85%	85%	50%	On	On
11:00pm to 12:00am	85%	85%	5%	On	On

Note:

The occupancy profile is expressed as a percentage of the maximum number of people that can be accommodated in the building. The artificial lighting profile is expressed as a percentage of the maximum *illumination power density* permitted under **Part J6**. The *air-conditioning* profile is expressed as the plant status.

Table 2f OCCUPANCY AND OPERATION PROFILES OF A CLASS 9b THEATRE OR CINEMA

Time period (local standard time)	Occupancy		Artificial lighting		*Air-conditioning*	
	Monday to Friday	Sat. & Sun.	Monday to Friday	Sat. & Sun.	Monday to Friday	Sat. & Sun.
12:00am to 1:00am	0%	0%	5%	5%	Off	Off
1:00am to 2:00am	0%	0%	5%	5%	Off	Off
2:00am to 3:00am	0%	0%	5%	5%	Off	Off
3:00am to 4:00am	0%	0%	5%	5%	Off	Off

Table 2f OCCUPANCY AND OPERATION PROFILES OF A CLASS 9b THEATRE OR CINEMA (Continued)

Time period (local standard time)	Occupancy		Artificial lighting		*Air-conditioning*	
	Monday to Friday	Sat. & Sun.	Monday to Friday	Sat. & Sun.	Monday to Friday	Sat. & Sun.
4:00am to 5:00am	0%	0%	5%	5%	Off	Off
5:00am to 6:00am	0%	0%	5%	5%	Off	Off
6:00am to 7:00am	0%	0%	5%	5%	Off	Off
7:00am to 8:00am	0%	0%	5%	5%	Off	On
8:00am to 9:00am	0%	20%	100%	100%	Off	On
9:00am to 10:00am	0%	80%	10%	10%	Off	On
10:00am to 11:00am	0%	80%	10%	10%	Off	On
11:00am to 12:00pm	0%	80%	10%	10%	On	On
12:00pm to 1:00pm	20%	20%	100%	100%	On	On
1:00pm to 2:00pm	80%	80%	5%	5%	On	On
2:00pm to 3:00pm	80%	80%	5%	5%	On	On
3:00pm to 4:00pm	80%	80%	5%	5%	On	On
4:00pm to 5:00pm	80%	80%	5%	5%	On	On
5:00pm to 6:00pm	20%	20%	100%	100%	On	On
6:00pm to 7:00pm	20%	20%	100%	100%	On	On
7:00pm to 8:00pm	80%	80%	100%	100%	On	On
8:00pm to 9:00pm	80%	80%	5%	5%	On	On
9:00pm to 10:00pm	80%	80%	5%	5%	On	On
10:00pm to 11:00pm	80%	80%	5%	5%	On	On
11:00pm to 12:00am	10%	10%	100%	100%	On	On

Note:

The occupancy profile is expressed as a percentage of the maximum number of people that can be accommodated in the building. The artificial lighting profile is expressed as a percentage of the maximum *illumination power density* permitted under **Part J6**. The *air-conditioning* profile is expressed as the plant status.

Table 2g OCCUPANCY AND OPERATION PROFILES OF A CLASS 9b SCHOOL

Time period (local standard time)	Occupancy (Monday to Friday)	Artificial lighting (Monday to Friday)	Appliances and equipment (Monday to Friday)	*Air-conditioning* (Monday to Friday)
12:00am to 1:00am	0%	5%	5%	Off
1:00am to 2:00am	0%	5%	5%	Off
2:00am to 3:00am	0%	5%	5%	Off
3:00am to 4:00am	0%	5%	5%	Off
4:00am to 5:00am	0%	5%	5%	Off
5:00am to 6:00am	0%	5%	5%	Off
6:00am to 7:00am	0%	5%	5%	Off
7:00am to 8:00am	5%	30%	30%	On
8:00am to 9:00am	75%	85%	85%	On
9:00am to 10:00am	90%	95%	95%	On
10:00am to 11:00am	90%	95%	95%	On
11:00am to 12:00pm	90%	95%	95%	On
12:00pm to 1:00pm	50%	80%	70%	On
1:00pm to 2:00pm	50%	80%	70%	On
2:00pm to 3:00pm	90%	95%	95%	On
3:00pm to 4:00pm	70%	90%	80%	On
4:00pm to 5:00pm	50%	70%	60%	On
5:00pm to 6:00pm	20%	20%	20%	Off
6:00pm to 7:00pm	20%	20%	20%	Off
7:00pm to 8:00pm	20%	20%	20%	Off
8:00pm to 9:00pm	10%	10%	10%	Off
9:00pm to 10:00pm	5%	5%	5%	Off
10:00pm to 11:00pm	5%	5%	5%	Off
11:00pm to 12:00am	5%	5%	5%	Off

Notes:

1. The occupancy profile is expressed as a percentage of the maximum number of people that can be accommodated in the building. The artificial lighting profile is expressed as a percentage of the maximum *illumination power density* permitted under **Part J6**. The appliances and equipment profile is expressed as a percentage of the maximum internal heat gain in **Table 2h**. The *air-conditioning* profile is expressed as the plant status.

Table 2g OCCUPANCY AND OPERATION PROFILES OF A CLASS 9b SCHOOL (Continued)

Time period (local standard time)	Occupancy (Monday to Friday)	Artificial lighting (Monday to Friday)	Appliances and equipment (Monday to Friday)	*Air-conditioning* (Monday to Friday)
2. Saturday and Sunday profiles are 5% continuous artificial lighting and 5% continuous appliances and equipment. There is no occupancy and the *air-conditioning* is "off".				

Table 2h INTERNAL HEAT GAINS FOR APPLIANCES AND EQUIPMENT

Application	Internal sensible heat gain rate (W/m^2)
Sole-occupancy unit of a Class 3 building, a Class 9a building *ward area* or Class 9c *aged care building*	5 W/m^2 averaged for 24 hours per day, 7 days per week, continuous operation
Class 5 building, Class 8 laboratory and a Class 9a clinic, day surgery and a procedure unit.	15 W/m^2
Class 6 shop and shopping centre, Class 6 cafe and restaurant and Class 9b *school*	5 W/m^2
Other applications	No load

Table 2i HOT WATER SUPPLY CONSUMPTION RATES

Application	Daily consumption rate
Residential part of a hotel or motel	75 L/*sole-occupancy unit*
Dormitory, boarding house, guest house, hostel, lodging-house and backpackers accommodation	50 L/person
Residential part of a *school*, accommodation for the aged, children or people with disabilities and a *detention centre* or a *health care building* which accommodates members of staff	
Class 9c *aged care building*	
Office, laboratory, shop and *assembly building*	4 L/person
Dining room, restaurant and cafe	9 L/meal
Health care building ward area	70 L/patient
School	7 L/person
Other applications	4 L/person

PART J0 ENERGY EFFICIENCY

Deemed-to-Satisfy Provisions

J0.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **JP1** and **JP3** are satisfied by complying with—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

J0.1 Application of Section J

Performance Requirements **JP1**, **JP2** and **JP3** are satisfied by complying with—

(a) for reducing the heating or cooling loads—

(i) of *sole-occupancy units* of a Class 2 building or a Class 4 part of a building, **J0.2** and **J0.3**; and

(ii) of a Class 2 to 9 building, other than the *sole-occupancy units* of a Class 2 building or a Class 4 part, **Parts J1**, **J2** and **J3**; and

(b) for *air-conditioning* and ventilation, **Part J5**; and

(c) for artificial lighting and power, **Part J6**; and

(d) for hot water supply and *swimming pool* and spa pool plant, **Part J7**; and

(e) for facilities for maintenance and monitoring, **Part J8**.

J0.2 Heating and cooling loads of sole-occupancy units of a Class 2 building or a Class 4 part

The *sole-occupancy units* of a Class 2 building or a Class 4 part must—

(a) for reducing the heating or cooling loads—

(i) collectively achieve an average energy rating of not less than 6 stars; and

(ii) individually achieve an energy rating of not less than 5 stars,

using *house energy rating software*; and

(b) for general thermal construction, comply with **J1.2**; and

(c) for thermal breaks, comply with **J1.3(d)** and **J1.5(c)**; and

(d) for compensating for a loss of ceiling insulation, comply with **J1.3(c)**, and

(e) for floor edge insulation, comply with **J1.6(c)** and **J1.6(d)**; and

(f) for building sealing, comply with **Part J3**.

J0.3 Ceiling fans

Ceiling fans *required* as part of compliance with **J0.2(a)**, must—

(a) be permanently installed; and

(b) have a speed controller; and

(c) serve the whole room, with the *floor area* that a single fan serves not exceeding—

(i) 15 m^2 if it has a blade rotation diameter of not less than 900 mm; and

(ii) 25 m^2 if it has a blade rotation diameter of not less than 1200 mm.

PART J1 BUILDING FABRIC

Deemed-to-Satisfy Provisions

J1.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **JP1** and **JP3** are satisfied by complying with—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

J1.1 Application of Part

The *Deemed-to-Satisfy Provisions* of this Part apply to building elements forming the *envelope* of a Class 2 to 9 building other than—

(a) a Class 7, 8 or 9b building that does not have a *conditioned space*; or

(b) an atrium or solarium that is not a *conditioned space* and is separated from the remainder of the building by an *envelope*.

J1.2 Thermal construction — general

(a) Where *required*, insulation must comply with AS/NZS 4859.1 and be installed so that it—

(i) abuts or overlaps adjoining insulation other than at supporting members such as studs, noggings, joists, furring channels and the like where the insulation must be against the member; and

(ii) forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and

(iii) does not affect the safe or effective operation of a *service* or fitting.

(b) Where *required*, *reflective insulation* must be installed with—

(i) the necessary airspace to achieve the *required R-Value* between a reflective side of the *reflective insulation* and a building lining or cladding; and

(ii) the *reflective insulation* closely fitted against any penetration, door or *window* opening; and

(iii) the *reflective insulation* adequately supported by framing members; and

(iv) each adjoining sheet of roll membrane being—

(A) overlapped not less than 50 mm; or

(B) taped together.

(c) Where *required*, bulk insulation must be installed so that—

(i) it maintains its position and thickness, other than where it is compressed between cladding and supporting members, water pipes, electrical cabling or the like; and

(ii) in a ceiling, where there is no bulk insulation or *reflective insulation* in the wall beneath, it overlaps the wall by not less than 50 mm.

(d) Roof, ceiling, wall and floor materials, and associated surfaces are deemed to have the thermal properties listed in **Specification J1.2**.

J1.3 Roof and ceiling construction

(a) A roof or ceiling that is part of the *envelope*, other than of a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, must achieve the *Total R-Value* specified in **Table J1.3a** for the direction of heat flow.

Table J1.3a ROOFS AND CEILINGS - MINIMUM TOTAL R-VALUE FOR EACH CLIMATE ZONE

Climate zone	**1, 2, 3, 4 and 5**	**6**	**7**	**8**
Direction of heat flow	Downwards		Upwards	
Minimum *Total R-Value* for a roof or ceiling with a roof upper surface solar absorptance value of not more than 0.4	3.2	3.2	3.7	4.8
Minimum *Total R-Value* for a roof or ceiling with a roof upper surface solar absorptance value of more than 0.4 but not more than 0.6	3.7	3.2	3.7	4.8

Deemed-to-Satisfy Provisions

Table J1.3a ROOFS AND CEILINGS - MINIMUM TOTAL R-VALUE FOR EACH CLIMATE ZONE (Continued)

Climate zone	1, 2, 3, 4 and 5	6	7	8
Direction of heat flow	Downwards		Upwards	
Minimum *Total R-Value* for a roof or ceiling with a roof upper surface solar absorptance value of more than 0.6	4.2	3.2	3.7	4.8

(b) For compliance with **Table J1.3a**, roof and ceiling construction is deemed to have the thermal properties listed in **Specification J1.3**.

(c) Where, for operational or safety reasons associated with exhaust fans, flues or recessed downlights, the area of *required* ceiling insulation is reduced, the loss of insulation must be compensated for by increasing the *R-Value* of the insulation in the remainder of the ceiling in accordance with **Table J1.3b**.

Table J1.3b ADJUSTMENT OF MINIMUM R-VALUE FOR LOSS OF CEILING INSULATION

Percentage of ceiling area uninsulated	**Minimum *R-Value* of ceiling insulation *required* to satisfy J1.3(a)**										
	1.0	**1.5**	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**4.5**	**5.0**	**5.5**	**6.0**
	Adjusted minimum *R-Value* of ceiling insulation *required* to compensate for loss of ceiling insulation area										
0.5% to less than 1.0%	1.0	1.6	2.2	2.8	3.4	4.0	4.7	5.4	6.2	6.9	
1.0% to less than 1.5%	1.1	1.7	2.3	2.9	3.6	4.4	5.2	6.1	7.0		
1.5% to less than 2.0%	1.1	1.7	2.4	3.1	3.9	4.8	5.8	6.8			
2.0% to less than 2.5%	1.1	1.8	2.5	3.3	4.2	5.3	6.5				
2.5% to less than 3.0%	1.2	1.9	2.6	3.6	4.6	5.9					
3.0% to less than 4.0%	1.2	2.0	3.0	4.2	5.7						
4.0% to less than 5.0%	1.3	2.2	3.4	5.0							
5.0% or more											

Not Permitted

Note:

Where the minimum *R-Value* of ceiling insulation *required* to satisfy **J1.3(a)** is between the values stated, interpolation may be used to determine the adjusted minimum *R-Value*.

Deemed-to-Satisfy Provisions

(d) A roof that—

(i) is *required* to achieve a minimum *Total R-Value*; and

(ii) has metal sheet roofing fixed to metal purlins, metal rafters or metal battens; and

(iii) does not have a ceiling lining or has a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens (see **Specification J1.3 Figure 2(c)** and **(f)**),

must have a thermal break, consisting of a material with an *R-Value* of not less than R0.2, installed between the metal sheet roofing and its supporting metal purlins, metal rafters or metal battens.

SA J1.3(e)

J1.4 Roof lights

Roof lights, including any associated shaft and diffuser, that form part of the *envelope*, other than of a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, must—

(a) if the *roof lights* are not *required* for compliance with **Part F4**, comply with **Table J1.4**; or

(b) if the *roof lights* are *required* for compliance with Part **F4**—

(i) have an area not more than 150% of the minimum area *required* by **F4.6**; and

(ii) have transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of not more than—

(A) 0.29 *SHGC*; and

(B) 2.9 *Total U-Value*.

Table J1.4 ROOF LIGHTS - THERMAL PERFORMANCE OF TRANSPARENT AND TRANSLUCENT ELEMENTS

Roof light shaft index (see Note 1)	Constant	Total area of *roof lights* serving the room or space as a percentage of the *floor area* of the room or space			
		Up to 2%	More than 2% to and up to 3%	More than 3% and up to 4%	More than 4% and up to 5%
Less than 0.5	*SHGC*	Not more than 0.83	Not more than 0.57	Not more than 0.43	Not more than 0.34
	Total U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
0.5 to less than 1.0	*SHGC*	Not more than 0.83	Not more than 0.72	Not more than 0.54	Not more than 0.43
	Total U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4

Deemed-to-Satisfy Provisions

Table J1.4 ROOF LIGHTS - THERMAL PERFORMANCE OF TRANSPARENT AND TRANSLUCENT ELEMENTS (Continued)

Roof light shaft index (see Note 1)	Constant	Total area of *roof lights* serving the room or space as a percentage of the *floor area* of the room or space			
		Up to 2%	More than 2% to and up to 3%	More than 3% and up to 4%	More than 4% and up to 5%
1.0 to less than 2.5	*SHGC*	Not more than 0.83	Not more than 0.83	Not more than 0.69	Not more than 0.55
	Total U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
2.5 and more	*SHGC*	Not more than 0.83	Not more than 0.83	Not more than 0.83	Not more than 0.83
	Total U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4

Notes:

1. The *roof light* shaft index is determined by measuring the distance from the centre of the shaft at the roof to the centre of the shaft at the ceiling level and dividing it by the average internal dimension of the shaft opening at the ceiling level (or the diameter for a circular shaft) in the same units of measurement.
2. The total area of *roof lights* is the combined area for all *roof lights* serving the room or space.
3. The area of a *roof light* is the area of the roof opening that allows light to enter the building.
4. The thermal performance of an imperforate ceiling diffuser may be included in the *Total U-Value* and *SHGC* of the *roof light*.
5. The total area of *roof lights* serving the room or space as a percentage of the *floor area* of the room or space must not exceed 5% unless allowed by **J1.4(b)**.

J1.5 Walls

(a) Each part of an *external wall* that is part of the *envelope*, other than of a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, must satisfy one of the options in **Table J1.5a** except for—

(i) opaque non-glazed openings in *external walls* such as doors (including garage doors), vents, penetrations, shutters and the like; and

(ii) *glazing*; and

(iii) an earth retaining wall or earth-berm, in other than *climate zone* 8.

Deemed-to-Satisfy Provisions

Table J1.5a OPTIONS FOR EACH PART OF AN EXTERNAL WALL THAT IS PART OF AN ENVELOPE

Climate zone	Options
1, 2 and 3	(a) (i) Achieve a minimum *Total R-Value* of 3.3. (ii) The minimum *Total R-Value* in (i) is reduced— (A) for a wall with a surface density of not less than 220 kg/m^2, by 0.5; and (B) for a wall that is— (aa) facing the south orientation as described in **Figure J2.3**, by 0.5; or (bb) shaded with a projection shade angle in accordance with **Figure J1.5** of— (AA) 15 degrees to not more than 45 degrees, by 0.5; or (BB) more than 45 degrees, by 1.0; and (C) if the outer surface solar absorptance value is not more than 0.6, by 0.5.
	(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like— (i) achieve a minimum *Total R-Value* of 1.4; and (ii) satisfy *glazing* energy index Option B of **Table J2.4a**.
4, 5 and 6	(a) (i) Achieve a minimum *Total R-Value* of 2.8. (ii) The minimum *Total R-Value* in (i) is reduced— (A) for a wall with a surface density of not less than 220 kg/m^2, by 0.5; and (B) for a wall that is— (aa) facing the south orientation as described in **Figure J2.3**, by 0.5; or (bb) shaded with a projection shade angle in accordance with **Figure J1.5** of— (AA) 30 degrees to not more than 60 degrees, by 0.5; or (BB) more than 60 degrees, by 1.0.
	(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like— (i) achieve a minimum *Total R-Value* of 1.4; and (ii) satisfy *glazing* energy index Option B of **Table J2.4a**.

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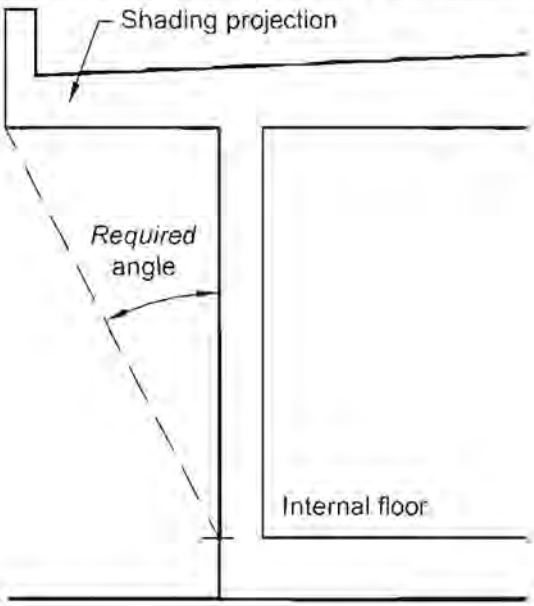
Table J1.5a OPTIONS FOR EACH PART OF AN EXTERNAL WALL THAT IS PART OF AN ENVELOPE (Continued)

Climate zone	Options
7	(a) Achieve a minimum *Total R-Value* of 2.8.
	(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like— (i) achieve a minimum *Total R-Value* of 1.4; and (ii) satisfy *glazing* energy index Option B of **Table J2.4a**.
8	(a) Achieve a minimum *Total R-Value* of 3.8.
	(b) Where the wall is an earth retaining wall or earth-berm, achieve a minimum *Total R-Value* of 2.0.

Figure J1.5
MEASUREMENT OF PROJECTION FOR WALL SHADING



(b) Any wall, other than an *external wall*, that is part of the *envelope* must achieve the *Total R-Value* in **Table J1.5b**.

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Table J1.5b AN ENVELOPE WALL OTHER THAN AN EXTERNAL WALL – MINIMUM TOTAL R-VALUE

Location	*Climate zone*							
	1	2	3	4	5	6	7	8
(a) With the non-*conditioned space*— (i) enclosed, with mechanical ventilation of not more than 1.5 air changes per hour of outside air; and (ii) *glazing* not more than that *required* by **Part J2**.	1.0	1.0	Nil	Nil	1.0	1.0	1.5	2.5
(b) For other than (a)	2.3	2.3	2.3	1.8	1.8	1.8	2.8	3.8

(c) A wall that—

(i) is *required* to achieve a minimum *Total R-Value*; and

(ii) has lightweight external cladding such as weatherboards, fibre cement or metal sheeting fixed to a metal frame; and

(iii) does not have a wall lining or has a wall lining that is fixed directly to the same metal frame,

must have a thermal break, consisting of a material with an *R-Value* of not less than R0.2, installed between the external cladding and the metal frame.

(d) For compliance with **Table J1.5a** and **Table J1.5b**, wall construction is deemed to have the thermal properties listed in **Specification J1.5**.

J1.6 Floors

(a) A floor that is part of the *envelope* of a building, other than a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building, including a floor above or below a *carpark* or a plant room—

(i) must achieve the *Total R-Value* specified in **Table J1.6**; and

(ii) with an in-slab heating or cooling system, must be insulated around the vertical edge of its perimeter with insulation having an *R-Value* of not less than 1.0.

(b) In *climate zones* 1 to 6, the minimum *Total R-Value required* in **(a)** may be reduced by R0.5 provided R0.75 is added to the *Total R-Value required* for the roof and ceiling construction.

(c) A concrete slab-on-ground—

(i) with an in-slab heating or cooling system; or

(ii) located in *climate zone* 8,

must have insulation installed around the vertical edge of its perimeter.

(d) Insulation *required* by **(c)** must—

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(i) have an *R-Value* of not less than 1.0; and

(ii) be water resistant; and

(iii) be continuous from the adjacent finished ground level—

(A) to a depth of not less than 300 mm; or

(B) for the full depth of the vertical edge of the concrete slab-on-ground.

(e) Floor construction is deemed to have the thermal properties listed in **Specification J1.6**.

Table J1.6 FLOORS — MINIMUM TOTAL R-VALUE

Location	*Climate zone*							
	1	2	3	4	5	6	7	8
(a) A slab on ground:								
(i) Without an in-slab heating or cooling system	Nil	Nil	Nil	Nil	Nil	Nil	1.0	2.0
(ii) With an in-slab heating or cooling system	1.25	1.25	1.25	1.25	1.25	1.25	1.25	2.25
(b) A suspended floor without an in-slab heating or cooling system where the non-*conditioned space* is— (i) enclosed; and (ii) where mechanically ventilated by not more than 1.5 air changes per hour.	1.0	1.0	Nil	Nil	1.0	1.0	1.5	2.5
(c) A suspended floor with an in-slab heating or cooling system where the non-*conditioned space* is— (i) enclosed; and (ii) where mechanically ventilated by not more than 1.5 air changes per hour	1.25	1.25	1.25	1.25	1.25	1.25	1.75	2.75
(d) For other than (a), (b) or (c)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.5

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Table J1.6 FLOORS — MINIMUM TOTAL R-VALUE (Continued)

Location	*Climate zone*							
	1	2	3	4	5	6	7	8
Direction of heat flow	Upwards	Downwards and upwards		Downwards				

Note:

A sub-floor space with not more than 150% of the *required* sub-floor ventilation is considered enclosed.

PART J2 GLAZING

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J2.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **JP1** and **JP3** are satisfied by complying with—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

J2.1 Application of Part

The *Deemed-to-Satisfy Provisions* of this Part apply to elements forming the *envelope* of a building other than—

(a) a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building; or

(b) a Class 7, 8 or 9b building that does not have a *conditioned space*; or

(c) an atrium or solarium that is not a *conditioned space* and is separated from the remainder of the building by an *envelope*.

J2.2 * * * * *

This clause has deliberately been left blank.

J2.3 * * * * *

This clause has deliberately been left blank.

J2.4 Glazing

(a) The *glazing* in each *storey*, including any *mezzanine*, of a building must be assessed separately in accordance with **(b)** and **(c)** for—

(i) *glazing* in the external *fabric* facing each orientation; and

(ii) *glazing* with a P/H value of not less than 2 in the internal *fabric* using the south orientation sector energy constants in **Table J2.4b** and shading multipliers in **Table J2.4c** and **Table J2.4d**.

(b) The aggregate *air-conditioning* energy value attributable to the *glazing* must not exceed the allowance obtained by multiplying the facade area that is exposed to the *conditioned space* for the orientation by the energy index in **Table J2.4a**.

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Table J2.4a ENERGY INDEX

Application	Energy index option	*Climate zone*							
		1	2	3	4	5	6	7	8
Glazing in a Class 3 building and a Class 9c *aged care building*	A	0.067	0.132	0.091	0.086	0.092	0.090	0.059	0.027
	B	0.060	0.124	0.078	0.063	0.071	0.061	0.037	Not applicable
Display *glazing* in a shop or showroom	A	0.180	0.217	0.221	0.227	0.257	0.220	0.170	0.046
	B	0.173	0.209	0.208	0.204	0.236	0.191	0.148	Not applicable
Glazing in other than, a Class 3 building, a Class 9c *aged care building* or display *glazing* in a shop or showroom	A	0.130	0.181	0.172	0.142	0.175	0.116	0.083	0.023
	B	0.123	0.173	0.159	0.113	0.145	0.082	0.058	Not applicable

Note:

Option A applies to all *glazing* other than where compliance with Option B is *required* by **Table J1.5a**.

(c) The aggregate *air-conditioning* energy value must be calculated by adding the *air-conditioning* energy value through each *glazing* element in accordance with the following formula.

$$A_1[SHGC_1(C_A \times S_{H1} + C_B \times S_{C1}) + C_C \times U_1] + A_2[SHGC_2(C_A \times S_{H2} + C_B \times S_{C2}) + C_C \times U_2] + \ldots$$

where—

$A_{1, 2, etc}$ = the area of each *glazing* element; and

$C_{A, B \text{ and } C}$ = the energy constants A, B and C for the specific orientation from **Table J2.4b**; and

$SHGC_{1, 2, etc}$ = the *SHGC* of each *glazing* element; and

$S_{H1, 2, etc}$ = the heating shading multiplier for each *glazing* element obtained from **Table J2.4c**; and

$S_{C1, 2, etc}$ = the cooling shading multiplier for each *glazing* element obtained from **Table J2.4d**; and

$U_{1, 2, etc}$ = the *Total U-Value* of each *glazing* element.

(d) For the purposes of **(c)**, where the *air-conditioning* energy value of a *glazing* element is calculated to be negative, it must be taken to be zero.

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Table J2.4b ENERGY CONSTANTS (C_A, C_B AND C_C)

Climate zone	Energy constants	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
1	C_A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C_B	0.80	0.92	0.91	0.67	0.48	0.67	0.88	0.91
	C_C	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
2	C_A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C_B	1.20	1.40	1.31	0.84	0.48	0.70	1.03	1.17
	C_C	-0.01	-0.01	-0.01	0.00	0.00	0.00	-0.01	-0.01
3	C_A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C_B	1.01	1.16	1.08	0.69	0.41	0.67	1.01	1.09
	C_C	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
4	C_A	-0.16	-0.18	-0.30	-0.44	-0.45	-0.46	-0.40	-0.26
	C_B	1.25	1.37	1.18	0.68	0.35	0.60	0.98	1.20
	C_C	0.00	0.00	0.03	0.07	0.09	0.08	0.04	0.02
5	C_A	-0.06	-0.09	-0.18	-0.41	-0.47	-0.43	-0.28	-0.14
	C_B	1.46	1.55	1.32	0.75	0.41	0.68	1.13	1.38
	C_C	-0.02	-0.01	0.00	0.05	0.07	0.05	0.02	-0.01
6	C_A	-0.37	-0.38	-0.59	-0.82	-0.87	-0.90	-0.85	-0.61
	C_B	1.53	1.66	1.39	0.80	0.38	0.66	1.07	1.34
	C_C	-0.01	-0.01	0.03	0.11	0.15	0.13	0.08	0.03
7	C_A	-0.41	-0.43	-0.70	-0.76	-0.74	-0.85	-0.92	-0.71
	C_B	1.32	1.39	1.09	0.59	0.25	0.47	0.81	1.09
	C_C	0.00	0.01	0.06	0.13	0.16	0.15	0.11	0.05
8	C_A	-0.87	-0.81	-0.75	-0.61	-0.73	-0.75	-0.87	-0.92
	C_B	0.55	0.61	0.52	0.28	0.10	0.26	0.46	0.54
	C_C	0.13	0.12	0.14	0.17	0.20	0.19	0.22	0.15

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Table J2.4c HEATING SHADING MULTIPLIER (S_H)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
CLIMATE ZONES 1, 2 AND 3									
In *climate zones* 1, 2 and 3, the heating shading multiplier is to be taken as 1.0									
CLIMATE ZONES 4 AND 5									
Not more than 100 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.96	0.95	0.92	0.90	0.94	0.92	0.92	0.95
	0.4	0.86	0.83	0.79	0.78	0.87	0.83	0.80	0.85
	0.6	0.66	0.65	0.63	0.69	0.81	0.74	0.66	0.70
	0.8	0.30	0.41	0.43	0.62	0.77	0.66	0.50	0.47
	1.0	0.00	0.08	0.22	0.56	0.74	0.60	0.35	0.15
	1.2	0.00	0.00	0.08	0.52	0.71	0.54	0.21	0.00
	1.4	0.00	0.00	0.04	0.48	0.69	0.50	0.12	0.00
	1.6	0.00	0.00	0.02	0.45	0.67	0.46	0.08	0.00
	1.8	0.00	0.00	0.01	0.42	0.66	0.43	0.04	0.00
	2.0	0.00	0.00	0.00	0.39	0.64	0.39	0.00	0.00
More than 100 mm but not more than 500 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.99	0.99	0.98	0.97	0.98	0.97	0.98	0.99
	0.4	0.97	0.95	0.92	0.89	0.93	0.91	0.92	0.96
	0.6	0.91	0.88	0.84	0.81	0.88	0.85	0.85	0.90
	0.8	0.79	0.78	0.73	0.70	0.84	0.79	0.75	0.81
	1.0	0.59	0.63	0.62	0.67	0.80	0.73	0.65	0.69
	1.2	0.27	0.45	0.48	0.63	0.78	0.68	0.54	0.50
	1.4	0.03	0.28	0.35	0.59	0.75	0.63	0.44	0.31
	1.6	0.02	0.19	0.25	0.56	0.74	0.59	0.34	0.21
	1.8	0.01	0.09	0.14	0.52	0.72	0.55	0.25	0.10
	2.0	0.00	0.00	0.03	0.49	0.70	0.51	0.15	0.00

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Table J2.4c HEATING SHADING MULTIPLIER (S_H) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
More than 500 mm but not more than 1200 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99
	0.4	0.99	0.98	0.97	0.97	0.97	0.96	0.97	0.99
	0.6	0.98	0.97	0.94	0.92	0.95	0.93	0.94	0.97
	0.8	0.95	0.94	0.90	0.88	0.92	0.89	0.90	0.94
	1.0	0.91	0.89	0.84	0.83	0.89	0.85	0.84	0.90
	1.2	0.82	0.82	0.78	0.78	0.86	0.82	0.78	0.84
	1.4	0.67	0.71	0.70	0.73	0.84	0.78	0.71	0.75
	1.6	0.45	0.58	0.60	0.70	0.81	0.74	0.64	0.62
	1.8	0.22	0.44	0.51	0.66	0.79	0.71	0.56	0.48
	2.0	0.00	0.30	0.42	0.62	0.77	0.67	0.49	0.35
More than 1200 mm but less than 1800 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.4	1.00	0.99	0.99	0.98	0.99	0.98	0.98	0.99
	0.6	0.99	0.98	0.97	0.96	0.97	0.96	0.97	0.98
	0.8	0.98	0.97	0.95	0.93	0.95	0.93	0.94	0.97
	1.0	0.97	0.95	0.92	0.90	0.93	0.91	0.91	0.95
	1.2	0.94	0.92	0.88	0.87	0.91	0.88	0.87	0.93
	1.4	0.88	0.87	0.83	0.83	0.89	0.85	0.83	0.88
	1.6	0.77	0.80	0.77	0.80	0.87	0.82	0.77	0.83
	1.8	0.66	0.73	0.71	0.77	0.86	0.79	0.72	0.77
	2.0	0.56	0.66	0.66	0.73	0.84	0.77	0.67	0.71

able J2.4c HEATING SHADING MULTIPLIER (S_H) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
CLIMATE ZONES 6 AND 7									
Not more than 100 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.95	0.93	0.91	0.90	0.93	0.91	0.91	0.93
	0.4	0.82	0.82	0.78	0.79	0.86	0.81	0.78	0.80
	0.6	0.61	0.66	0.64	0.70	0.80	0.71	0.64	0.62
	0.8	0.31	0.46	0.49	0.63	0.74	0.63	0.52	0.41
	1.0	0.02	0.23	0.35	0.58	0.70	0.56	0.40	0.17
	1.2	0.00	0.04	0.23	0.53	0.66	0.51	0.30	0.02
	1.4	0.00	0.00	0.14	0.49	0.63	0.47	0.22	0.00
	1.6	0.00	0.00	0.10	0.45	0.60	0.44	0.16	0.00
	1.8	0.00	0.00	0.05	0.41	0.58	0.41	0.11	0.00
	2.0	0.00	0.00	0.01	0.37	0.55	0.38	0.05	0.00
More than 100 mm but not more than 500 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.99	0.99	0.98	0.97	0.97	0.97	0.97	0.98
	0.4	0.96	0.94	0.91	0.89	0.93	0.91	0.91	0.94
	0.6	0.88	0.87	0.83	0.82	0.87	0.84	0.82	0.86
	0.8	0.75	0.78	0.73	0.70	0.83	0.76	0.71	0.75
	1.0	0.57	0.66	0.62	0.68	0.78	0.69	0.61	0.60
	1.2	0.33	0.51	0.51	0.64	0.75	0.63	0.52	0.44
	1.4	0.14	0.37	0.42	0.60	0.72	0.59	0.44	0.30
	1.6	0.10	0.25	0.33	0.57	0.69	0.55	0.36	0.20
	1.8	0.05	0.12	0.25	0.53	0.67	0.51	0.29	0.10
	2.0	0.00	0.00	0.17	0.50	0.64	0.48	0.21	0.00

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Table J2.4c HEATING SHADING MULTIPLIER (S_H) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
More than 500 mm but not more than 1200 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99
	0.4	0.99	0.98	0.97	0.96	0.97	0.96	0.96	0.98
	0.6	0.97	0.96	0.93	0.92	0.94	0.92	0.92	0.96
	0.8	0.94	0.93	0.89	0.87	0.91	0.88	0.87	0.92
	1.0	0.88	0.88	0.83	0.82	0.87	0.83	0.81	0.86
	1.2	0.79	0.82	0.77	0.77	0.85	0.79	0.75	0.79
	1.4	0.66	0.73	0.69	0.73	0.82	0.75	0.68	0.69
	1.6	0.48	0.63	0.62	0.69	0.79	0.70	0.61	0.57
	1.8	0.30	0.53	0.54	0.66	0.76	0.66	0.55	0.45
	2.0	0.13	0.42	0.47	0.63	0.74	0.62	0.48	0.33
More than 1200 mm but less than 1800 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.00
	0.4	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.99
	0.6	0.99	0.98	0.97	0.96	0.96	0.95	0.96	0.98
	0.8	0.98	0.96	0.94	0.93	0.94	0.93	0.93	0.96
	1.0	0.96	0.94	0.91	0.89	0.92	0.90	0.89	0.93
	1.2	0.92	0.91	0.87	0.86	0.90	0.86	0.84	0.89
	1.4	0.85	0.87	0.82	0.82	0.87	0.83	0.80	0.84
	1.6	0.76	0.81	0.77	0.79	0.85	0.80	0.74	0.77
	1.8	0.67	0.75	0.72	0.75	0.83	0.77	0.69	0.69
	2.0	0.57	0.69	0.67	0.72	0.81	0.74	0.64	0.62

Deemed-to-Satisfy Provisions

Table J2.4c HEATING SHADING MULTIPLIER (S_H) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
CLIMATE ZONE 8									
Not more than 100 mm	**0.0**	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.90	0.91	0.90	0 93	0.93	0.91	0.92	0.91
	0.4	0.73	0.77	0.77	0.89	0.85	0.80	0.80	0.77
	0.6	0.55	0.63	0.68	0.83	0.77	0.72	0.68	0.62
	0.8	0 37	0.50	0.61	0.75	0.71	0.67	0.57	0.48
	1.0	0.19	0 35	0.53	0.67	0.66	0.64	0.49	0.37
	1.2	0.07	0.22	0.44	0.60	0.62	0.62	0.43	0.29
	1.4	0.00	0.12	0.36	0.53	0.59	0.59	0.38	0.21
	1.6	0 00	0.08	0.29	0.48	0.56	0.56	0.34	0.15
	1.8	0 00	0.04	0.23	0.43	0.53	0.52	0.31	0.09
	2.0	0.00	0.00	0.16	0.38	0.51	0.48	0 27	0.04
More than 100 mm but not more than 500 mm	**0.0**	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.96	0.96	0.95	0.95	0.96	0.95	0.96	0.96
	0.4	0.87	0.89	0.87	0 91	0.90	0.87	0.89	0.88
	0.6	0 73	0.79	0.78	0.87	0.85	0.81	0.81	0.78
	0.8	0.57	0.67	0.70	0.81	0.79	0.73	0.72	0.66
	1.0	0.42	0.56	0.64	0.79	0.75	0.69	0.63	0.54
	1.2	0 27	0.45	0.59	0 74	0.71	0.66	0.55	0.43
	1.4	0.17	0.32	0.52	0.67	0.67	0.63	0.49	0.35
	1.6	0.10	0.22	0.46	0.62	0.64	0.62	0.44	0.28
	1.8	0.03	0.13	0.39	0.57	0.62	0.61	0.40	0.22
	2.0	0.00	0.00	0.00	0.10	0.50	0.50	0.00	0.00

Deemed-to-Satisfy Provisions

Table J2.4c HEATING SHADING MULTIPLIER (S_H) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
More than 500 mm but not more than 1200 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.99	0.99	0.99	0.98	0.99	0.99	0.99	0.99
	0.4	0.97	0.97	0.96	0.95	0.96	0.95	0.96	0.97
	0.6	0.93	0.94	0.92	0.92	0.93	0.91	0.93	0.92
	0.8	0.85	0.89	0.87	0.88	0.90	0.86	0.88	0.87
	1.0	0.75	0.82	0.79	0.86	0.86	0.82	0.83	0.80
	1.2	0.65	0.73	0.74	0.86	0.82	0.78	0.77	0.72
	1.4	0.54	0.65	0.69	0.85	0.79	0.73	0.71	0.64
	1.6	0.42	0.56	0.66	0.81	0.76	0.70	0.65	0.55
	1.8	0.31	0.48	0.62	0.76	0.73	0.66	0.60	0.47
	2.0	0.20	0.39	0.58	0.72	0.70	0.63	0.54	0.39
More than 1200 mm but less than 1800 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	1.00	1.00	0.99	0.99	1.00	0.99	0.99	0.99
	0.4	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	0.6	0.96	0.97	0.96	0.96	0.96	0.95	0.96	0.96
	0.8	0.93	0.94	0.92	0.94	0.94	0.91	0.93	0.93
	1.0	0.88	0.91	0.89	0.91	0.91	0.89	0.90	0.89
	1.2	0.80	0.86	0.84	0.88	0.89	0.86	0.86	0.84
	1.4	0.72	0.80	0.78	0.87	0.86	0.83	0.81	0.78
	1.6	0.63	0.74	0.75	0.87	0.84	0.80	0.77	0.72
	1.8	0.54	0.67	0.71	0.86	0.82	0.77	0.72	0.65
	2.0	0.45	0.60	0.67	0.86	0.79	0.74	0.68	0.58

Notes:

1. In *climate zones* 4 to 8, where G is 1800 mm or more, the heating shading multiplier is to be taken as 1.0.
2. The heating shading multiplier for P/H values between those shown in **Table J2.4c** can be interpolated.
3. For *glazing* in the internal *fabric* use the appropriate value for the south orientation sector with a P/H value of 2.0.

Deemed-to-Satisfy Provisions

Table J2.4d COOLING SHADING MULTIPLIER (S_C)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
CLIMATE ZONES 1, 2 AND 3									
Not more than 100 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.79	0.84	0.86	0.85	0.87	0.87	0.87	0.84
	0.4	0.57	0.66	0.71	0.70	0.76	0.73	0.72	0.67
	0.6	0.41	0.52	0.58	0.58	0.68	0.62	0.60	0.53
	0.8	0.32	0.40	0.47	0.48	0.62	0.54	0.50	0.43
	1.0	0.26	0.32	0.39	0.42	0.58	0.48	0.43	0.35
	1.2	0.22	0.28	0.33	0.38	0.56	0.43	0.37	0.30
	1.4	0.20	0.24	0.29	0.34	0.53	0.39	0.33	0.25
	1.6	0.19	0.22	0.26	0.32	0.52	0.36	0.29	0.22
	1.8	0.18	0.20	0.23	0.30	0.50	0.33	0.26	0.20
	2.0	0.17	0.18	0.21	0.28	0.49	0.31	0.24	0.18
More than 100 mm but not more than 500 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.92	0.94	0.95	0.94	0.93	0.94	0.95	0.94
	0.4	0.72	0.81	0.85	0.83	0.84	0.84	0.85	0.81
	0.6	0.54	0.68	0.73	0.72	0.77	0.75	0.74	0.68
	0.8	0.42	0.56	0.63	0.57	0.71	0.66	0.64	0.56
	1.0	0.34	0.46	0.54	0.54	0.66	0.59	0.56	0.47
	1.2	0.29	0.38	0.46	0.48	0.62	0.54	0.49	0.41
	1.4	0.25	0.32	0.40	0.43	0.60	0.50	0.44	0.35
	1.6	0.23	0.29	0.35	0.40	0.57	0.46	0.39	0.31
	1.8	0.21	0.26	0.32	0.37	0.56	0.42	0.36	0.28
	2.0	0.20	0.24	0.29	0.34	0.54	0.39	0.32	0.25

Deemed-to-Satisfy Provisions

Table J2.4d COOLING SHADING MULTIPLIER (S_C) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
More than 500 mm but not more than 1200 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.97	0.98	0.98	0.98	0.96	0.98	0.98	0.98
	0.4	0.89	0.93	0.94	0.93	0.91	0.93	0.94	0.92
	0.6	0.74	0.85	0.88	0.86	0.86	0.86	0.87	0.84
	0.8	0.59	0.76	0.81	0.79	0.81	0.80	0.80	0.74
	1.0	0.49	0.66	0.73	0.72	0.77	0.73	0.72	0.66
	1.2	0.41	0.58	0.66	0.65	0.73	0.68	0.66	0.58
	1.4	0.35	0.51	0.59	0.59	0.69	0.63	0.60	0.51
	1.6	0.31	0.44	0.53	0.54	0.66	0.59	0.55	0.46
	1.8	0.28	0.39	0.48	0.50	0.64	0.55	0.50	0.41
	2.0	0.25	0.35	0.43	0.46	0.61	0.51	0.45	0.37
More than 1200 mm but less than 1800 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.98	0.99	0.99	0.99	0.98	0.99	0.99	0.99
	0.4	0.94	0.96	0.97	0.96	0.94	0.96	0.96	0.95
	0.6	0.86	0.92	0.93	0.92	0.90	0.91	0.92	0.90
	0.8	0.73	0.85	0.88	0.86	0.86	0.86	0.87	0.83
	1.0	0.59	0.87	0.83	0.80	0.82	0.81	0.81	0.76
	1.2	0.51	0.70	0.76	0.75	0.79	0.76	0.75	0.69
	1.4	0.44	0.63	0.71	0.70	0.76	0.71	0.70	0.62
	1.6	0.38	0.57	0.65	0.64	0.73	0.67	0.64	0.56
	1.8	0.34	0.52	0.60	0.60	0.70	0.63	0.60	0.51
	2.0	0.30	0.46	0.55	0.56	0.67	0.60	0.55	0.46

Deemed-to-Satisfy Provisions

Table J2.4d COOLING SHADING MULTIPLIER (S_C) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
CLIMATE ZONES 4 AND 5									
Not more than 100 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.81	0.85	0.87	0.86	0.90	0.88	0.87	0.84
	0.4	0.61	0.68	0.72	0.72	0.81	0.75	0.72	0.67
	0.6	0.46	0.54	0.59	0.61	0.74	0.64	0.60	0.53
	0.8	0.35	0.42	0.49	0.53	0.68	0.57	0.51	0.42
	1.0	0.28	0.34	0.42	0.47	0.64	0.50	0.44	0.34
	1.2	0.24	0.29	0.37	0.43	0.62	0.46	0.38	0.29
	1.4	0.22	0.26	0.33	0.39	0.59	0.42	0.34	0.26
	1.6	0.20	0.23	0.30	0.36	0.57	0.39	0.31	0.24
	1.8	0.20	0.21	0.27	0.34	0.56	0.37	0.29	0.22
	2.0	0.19	0.20	0.25	0.32	0.54	0.34	0.26	0.21
More than 100 mm but not more than 500 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.93	0.95	0.96	0.95	0.96	0.95	0.95	0.95
	0.4	0.77	0.83	0.86	0.85	0.89	0.86	0.85	0.82
	0.6	0.62	0.70	0.74	0.74	0.82	0.77	0.74	0.68
	0.8	0.48	0.58	0.64	0.60	0.76	0.68	0.64	0.56
	1.0	0.37	0.48	0.55	0.58	0.72	0.61	0.56	0.46
	1.2	0.32	0.40	0.48	0.52	0.68	0.56	0.50	0.39
	1.4	0.28	0.35	0.43	0.48	0.66	0.52	0.44	0.34
	1.6	0.25	0.30	0.39	0.45	0.64	0.48	0.40	0.30
	1.8	0.23	0.27	0.35	0.42	0.62	0.45	0.37	0.27
	2.0	0.21	0.25	0.32	0.39	0.60	0.42	0.34	0.25

Deemed-to-Satisfy Provisions

Table J2.4d COOLING SHADING MULTIPLIER (S_C) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
More than 500 mm but not more than 1200 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.97	0.98	0.98	0.98	0.98	0.98	0 98	0.98
	0.4	0.90	0.94	0.94	0.94	0.95	0.94	0.94	0.93
	0.6	0.81	0.86	0.88	0.87	0.91	0.88	0.88	0.85
	0.8	0.70	0.77	0.81	0.81	0.87	0.81	0.80	0.75
	1.0	0.58	0.68	0.74	0.74	0.82	0.76	0.73	0.66
	1.2	0.47	0.60	0.67	0.68	0.79	0.70	0.66	0.58
	1.4	0.40	0.52	0.61	0.62	0.75	0.65	0.60	0.50
	1.6	0.35	0.46	0.55	0.58	0.73	0.61	0.55	0.44
	1.8	0.31	0.41	0.50	0.54	0.70	0.57	0.50	0.39
	2.0	0.27	0.36	0.45	0.50	0.68	0.54	0.46	0.35
More than 1200 mm but less than 1800 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.98	0.99	0.99	0.99	0.99	0.99	0.99	0.99
	0.4	0.94	0.97	0.97	0.96	0.97	0.96	0.97	0.96
	0.6	0.88	0.92	0.93	0.93	0.94	0.92	0.93	0.91
	0.8	0.82	0.87	0.88	0.88	0.91	0.88	0.88	0.85
	1.0	0.72	0.80	0.83	0.82	0.88	0.83	0.82	0.77
	1.2	0.63	0.72	0.77	0.77	0.85	0.78	0.76	0.70
	1.4	0.53	0.65	0.72	0.73	0.82	0.74	0.71	0.63
	1.6	0.45	0.59	0.67	0.67	0.79	0.70	0.66	0.56
	1.8	0.40	0.53	0.62	0.63	0.77	0.66	0.61	0.50
	2.0	0.36	0.48	0.57	0.59	0.74	0.62	0.56	0.45

Deemed-to-Satisfy Provisions

Table J2.4d COOLING SHADING MULTIPLIER (S_C) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
CLIMATE ZONES 6 AND 7									
Not more than 100 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.82	0.86	0.87	0.87	0.90	0.88	0.87	0.84
	0.4	0.63	0.69	0.72	0.74	0.80	0.74	0.72	0.67
	0.6	0.49	0.56	0.60	0.64	0.73	0.64	0.61	0.54
	0.8	0.40	0.46	0.51	0.56	0.68	0.57	0.52	0.44
	1.0	0.35	0.38	0.44	0.51	0.64	0.51	0.45	0.38
	1.2	0.32	0.34	0.39	0.48	0.61	0.47	0.41	0.35
	1.4	0.31	0.32	0.36	0.45	0.59	0.44	0.37	0.32
	1.6	0.30	0.30	0.33	0.42	0.57	0.42	0.34	0.31
	1.8	0.30	0.29	0.31	0.41	0.56	0.40	0.32	0.30
	2.0	0.30	0.28	0.29	0.39	0.55	0.38	0.31	0.29
More than 100 mm but not more than 500 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95
	0.4	0.79	0.84	0.86	0.86	0.88	0.86	0.85	0.82
	0.6	0.64	0.71	0.75	0.76	0.81	0.76	0.74	0.68
	0.8	0.52	0.60	0.65	0.63	0.75	0.68	0.65	0.57
	1.0	0.43	0.51	0.57	0.61	0.71	0.61	0.57	0.48
	1.2	0.38	0.44	0.50	0.56	0.68	0.56	0.50	0.42
	1.4	0.35	0.39	0.45	0.52	0.65	0.52	0.46	0.38
	1.6	0.33	0.35	0.41	0.49	0.63	0.49	0.42	0.35
	1.8	0.32	0.33	0.38	0.47	0.62	0.46	0.39	0.33
	2.0	0.31	0.31	0.36	0.45	0.60	0.44	0.36	0.32

Deemed-to-Satisfy Provisions

Table J2.4d COOLING SHADING MULTIPLIER (S_C) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
More than 500 mm but not more than 1200 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.97	0.98	0.98	0.98	0.98	0.98	0.98	0.98
	0.4	0.91	0.94	0.94	0.94	0.94	0.94	0.94	0.93
	0.6	0.82	0.87	0.88	0.88	0.90	0.88	0.87	0.85
	0.8	0.72	0.79	0.81	0.82	0.85	0.81	0.80	0.75
	1.0	0.62	0.70	0.74	0.76	0.81	0.75	0.73	0.66
	1.2	0.53	0.62	0.67	0.70	0.77	0.70	0.67	0.58
	1.4	0.47	0.55	0.62	0.65	0.74	0.65	0.61	0.51
	1.6	0.42	0.49	0.56	0.61	0.72	0.61	0.56	0.46
	1.8	0.38	0.44	0.51	0.57	0.69	0.57	0.51	0.42
	2.0	0.35	0.40	0.47	0.54	0.67	0.54	0.47	0.38
More than 1200 mm but less than 1800 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
	0.4	0.95	0.97	0.97	0.96	0.97	0.96	0.97	0.96
	0.6	0.89	0.93	0.93	0.93	0.94	0.92	0.93	0.91
	0.8	0.82	0.87	0.88	0.88	0.90	0.88	0.87	0.85
	1.0	0.75	0.81	0.83	0.83	0.87	0.83	0.82	0.78
	1.2	0.67	0.74	0.78	0.79	0.83	0.78	0.76	0.70
	1.4	0.59	0.68	0.72	0.74	0.80	0.74	0.71	0.63
	1.6	0.52	0.61	0.67	0.70	0.77	0.70	0.66	0.57
	1.8	0.47	0.56	0.63	0.66	0.75	0.66	0.61	0.52
	2.0	0.43	0.51	0.58	0.62	0.73	0.63	0.57	0.47

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Table J2.4d COOLING SHADING MULTIPLIER (S_C) (Continued)

G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
CLIMATE ZONE 8									
Not more than 100 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.78	0.83	0.86	0.85	0.87	0.86	0.86	0.83
	0.4	0.58	0.65	0.70	0.71	0.75	0.73	0.71	0.65
	0.6	0.47	0.52	0.58	0.61	0.67	0.63	0.60	0.53
	0.8	0.43	0.44	0.49	0.54	0.62	0.56	0.52	0.45
	1.0	0.42	0.40	0.44	0.50	0.59	0.51	0.47	0.41
	1.2	0.41	0.39	0.41	0.48	0.57	0.48	0.43	0.39
	1.4	0.41	0.38	0.39	0.46	0.56	0.46	0.40	0.38
	1.6	0.40	0.37	0.37	0.45	0.55	0.45	0.39	0.37
	1.8	0.40	0.37	0.36	0.44	0.54	0.44	0.38	0.37
	2.0	0.40	0.36	0.36	0.43	0.53	0.44	0.37	0.37
More than 100 mm but not more than 500 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.91	0.94	0.95	0.94	0.94	0.95	0.95	0.94
	0.4	0.74	0.81	0.84	0.83	0.85	0.84	0.85	0.80
	0.6	0.58	0.66	0.73	0.73	0.77	0.75	0.74	0.67
	0.8	0.48	0.55	0.62	0.60	0.70	0.66	0.65	0.56
	1.0	0.44	0.47	0.54	0.58	0.65	0.60	0.57	0.48
	1.2	0.43	0.42	0.49	0.54	0.62	0.55	0.51	0.44
	1.4	0.42	0.40	0.45	0.51	0.60	0.52	0.47	0.41
	1.6	0.41	0.39	0.42	0.49	0.58	0.49	0.44	0.39
	1.8	0.41	0.38	0.40	0.47	0.57	0.48	0.42	0.38
	2.0	0.41	0.37	0.38	0.46	0.56	0.46	0.40	0.38

Table J2.4d COOLING SHADING MULTIPLIER (S_C) (Continued)

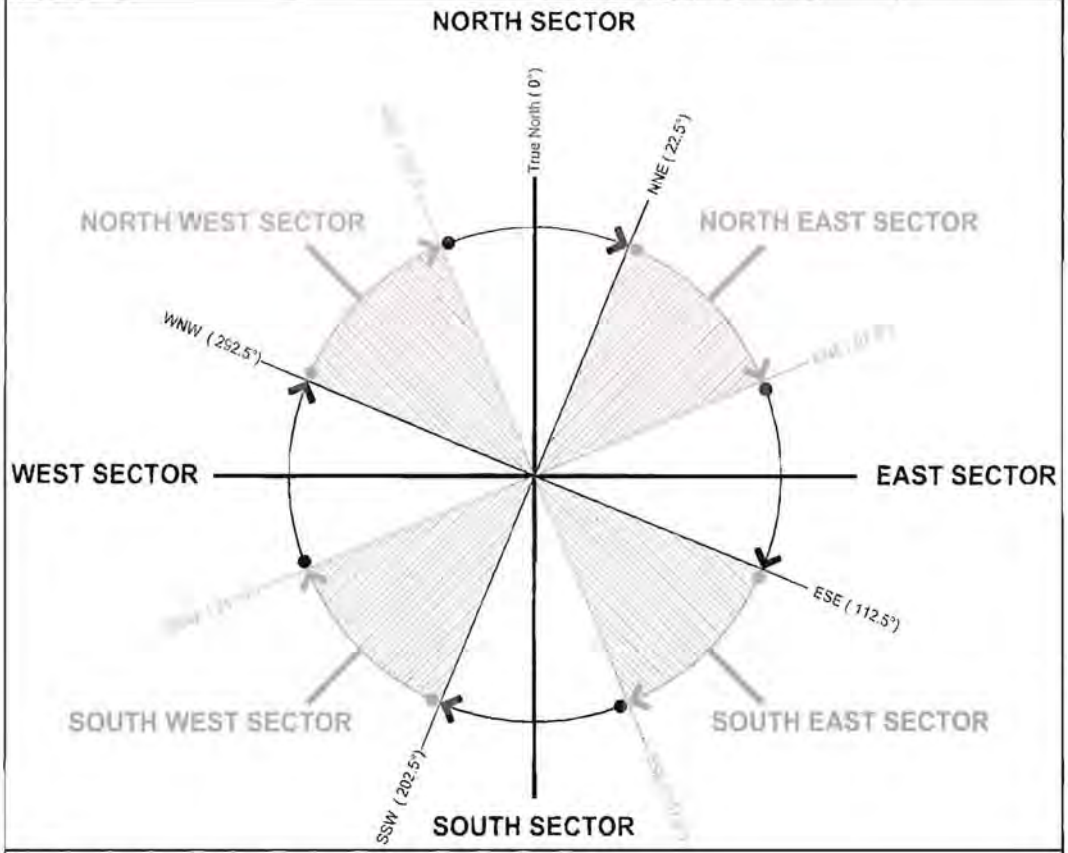
G (refer Figure J2.4)	P/H (refer Figure J2.4)	Orientation Sector (refer Figure J2.3)							
		North	North east	East	South east	South	South west	West	North west
More than 500 mm but not more than 1200 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.97	0.98	0.98	0.98	0.97	0.98	0.98	0.97
	0.4	0.88	0.93	0.94	0.93	0.93	0.93	0.93	0.92
	0.6	0.78	0.84	0.87	0.86	0.87	0.86	0.87	0.83
	0.8	0.66	0.74	0.79	0.79	0.81	0.80	0.80	0.74
	1.0	0.56	0.64	0.71	0.72	0.75	0.73	0.73	0.64
	1.2	0.49	0.56	0.65	0.66	0.71	0.68	0.66	0.57
	1.4	0.46	0.50	0.59	0.61	0.68	0.64	0.61	0.51
	1.6	0.44	0.45	0.54	0.57	0.66	0.60	0.56	0.47
	1.8	0.43	0.42	0.49	0.54	0.63	0.57	0.52	0.44
	2.0	0.42	0.40	0.46	0.52	0.61	0.53	0.49	0.42
More than 1200 mm but less than 1800 mm	0.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	0.2	0.98	0.99	0.99	0.99	0.99	0.99	0.99	0.99
	0.4	0.93	0.96	0.96	0.96	0.95	0.96	0.96	0.95
	0.6	0.86	0.91	0.93	0.91	0.91	0.91	0.92	0.90
	0.8	0.78	0.84	0.87	0.86	0.87	0.86	0.87	0.83
	1.0	0.69	0.77	0.82	0.80	0.82	0.81	0.81	0.76
	1.2	0.60	0.69	0.75	0.75	0.78	0.76	0.76	0.68
	1.4	0.54	0.62	0.69	0.70	0.74	0.72	0.70	0.62
	1.6	0.49	0.55	0.65	0.65	0.71	0.68	0.66	0.56
	1.8	0.47	0.50	0.60	0.62	0.69	0.64	0.61	0.52
	2.0	0.45	0.46	0.55	0.58	0.67	0.61	0.57	0.48

Notes:

1. Where G is 1800 mm or more, the cooling shading multiplier is to be taken as 1.0.
2. The cooling shading multiplier for P/H values between those shown in **Table J2.4d** can be interpolated.
3. For *glazing* in the internal *fabric* use the appropriate value for the south orientation sector with a P/H value of 2.0.

Figure J2.3

ORIENTATION SECTORS

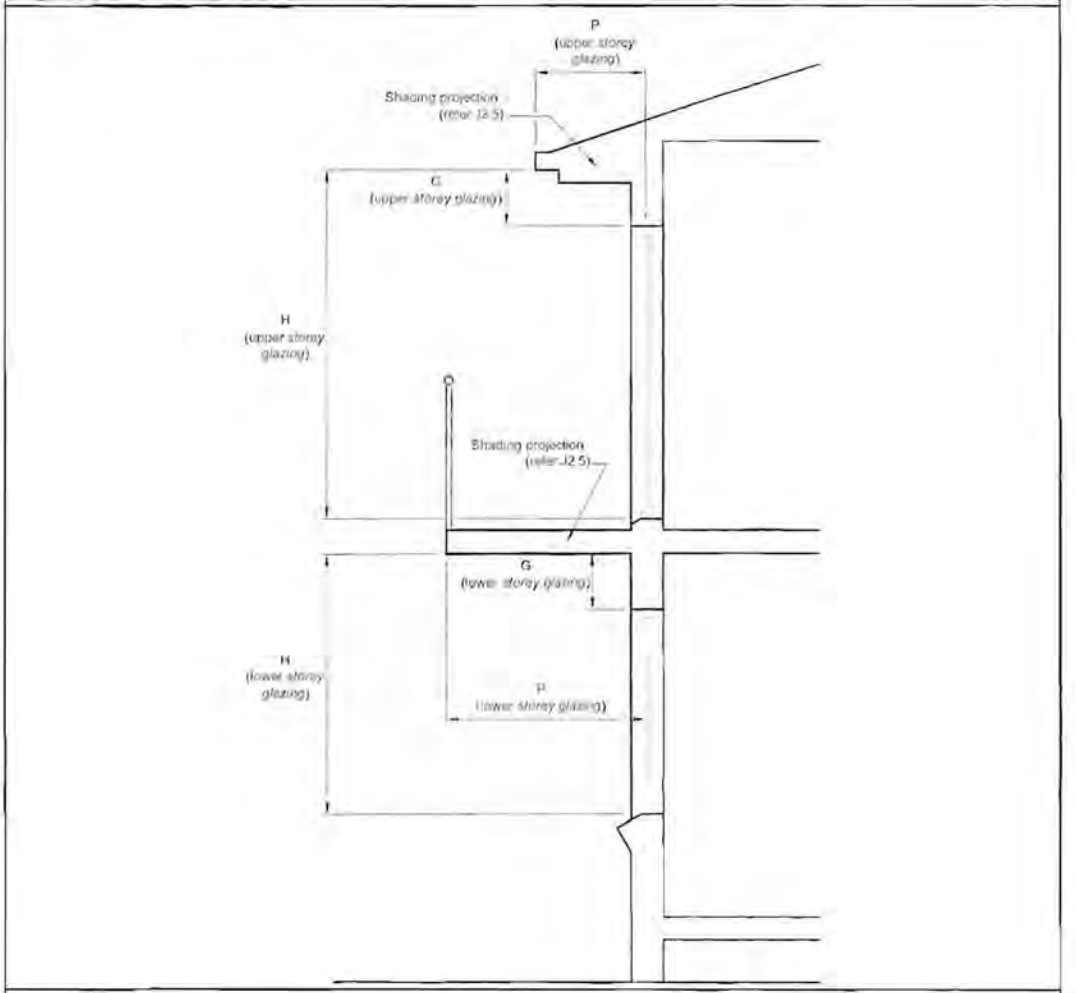


Note:

The orientation sector for a wall or *glazing* element is the sector that contains a line drawn perpendicular to the face of the wall or *glazing* element.

Figure J2.4

METHOD OF MEASURING P AND H



Notes:

An external shading device that complies with **J2.5(b)** is considered to achieve a P/H value of 2.

J2.5 Shading

Where shading is *required* to comply with **J2.4**, it must—

(a) be provided by an external permanent projection, such as a verandah, balcony, fixed canopy, eaves or shading hood, which—

(i) extends horizontally on both sides of the *glazing* for the same projection distance P in **Figure J2.4**; or

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(ii) provides the equivalent shading to **(i)** with a reveal or the like; or

(b) be provided by an external shading device, such as a shutter, blind, vertical or horizontal building screen with blades, battens or slats, which—

(i) is capable of restricting at least 80% of summer solar radiation; and

(ii) if adjustable, is operated automatically in response to the level of solar radiation.

PART J3 BUILDING SEALING

Deemed-to-Satisfy Provisions

J3.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **JP1** and **JP3** are satisfied by complying with—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

J3.1 Application of Part

The *Deemed-to-Satisfy Provisions* of this Part apply to elements forming the *envelope* of a Class 2 to 9 building, other than—

(a) a building in *climate zones* 1, 2, 3 and 5 where the only means of *air-conditioning* is by using an evaporative cooler; or

(b) a permanent building opening, in a space where a gas appliance is located, that is necessary for the safe operation of a gas appliance; or

(c) a Class 6, 7, 8 and 9b building that does not have a *conditioned space*; or

(d) a building or space where the mechanical ventilation *required* by **Part F4** provides sufficient pressurisation to prevent infiltration; or

(e) an atrium or solarium that is not a *conditioned space* and is separated from the remainder of the building by an *envelope*.

NSW J3.1(f)

J3.2 Chimneys and flues

The chimney or flue of an open solid-fuel burning appliance must be provided with a damper or flap that can be closed to seal the chimney or flue.

J3.3 Roof lights

(a) A *roof light* must be sealed, or capable of being sealed, when serving—

(i) a *conditioned space*; or

(ii) a *habitable room* in *climate zones* 4, 5, 6, 7 and 8.

(b) A *roof light required* by **(a)** to be sealed, or capable of being sealed, must be constructed with—

(i) an imperforate ceiling diffuser or the like installed at the ceiling or internal lining level; or

(ii) a weatherproof seal; or

(iii) a shutter system readily operated either manually, mechanically or electronically by the occupant.

J3.4 Windows and doors

(a) A seal to restrict air infiltration must be fitted to each edge of a door, openable *window* or the like forming part of—

(i) the *envelope* of a *conditioned space*; or

(ii) the external fabric of a *habitable room* or public area in *climate zones* 4, 5, 6, 7 and 8.

(b) The requirements of **(a)** do not apply to—

(i) a *window* complying with AS 2047; or

(ii) a fire door or smoke door; or

(iii) a roller shutter door, roller shutter grille or other security door or device installed only for out-of-hours security.

(c) A seal *required* by **(a)**—

(i) for the bottom edge of an external swing door, must be a draft protection device; and

(ii) for the other edges of an external door or the edges of an openable *window* or other such opening, may be a foam or rubber compression strip, fibrous seal or the like.

(d) An entrance to a building, if leading to a *conditioned space* must have an airlock, *self-closing* door, revolving door or the like, other than—

(i) where the *conditioned space* has a *floor area* of not more than 50 m^2; or

(ii) where a café, restaurant, open front shop or the like has—

(A) a 3 m deep un-conditioned zone between the main entrance, including an open front, and the *conditioned space*; and

(B) at all other entrances to the café, restaurant, open front shop or the like, *self-closing* doors.

J3.5 Exhaust fans

A miscellaneous exhaust fan, such as a bathroom or domestic kitchen exhaust fan, must be fitted with a sealing device such as a self-closing damper or the like when serving—

(a) a *conditioned space*; or

(b) a *habitable room* in *climate zones* 4, 5, 6, 7 and 8.

J3.6 Construction of roofs, walls and floors

(a) Roofs, ceilings, walls, floors and any opening such as a *window* frame, door frame, *roof light* frame or the like must be constructed to minimise air leakage in accordance with **(b)** when forming part of—

(i) the *envelope*; or

(ii) the external *fabric* of a *habitable room* or a public area in *climate zones* 4, 5, 6, 7 and 8.

(b) Construction *required* by **(a)** must be—

(i) enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions; or

(ii) sealed by caulking, skirting, architraves, cornices or the like.

(c) The requirements of **(a)** do not apply to openings, grilles or the like *required* for smoke hazard management.

J3.7 Evaporative coolers

An evaporative cooler must be fitted with a self-closing damper or the like when serving—

(a) a heated space; or

(b) a *habitable room* or a public area of a building in *climate zones* 4, 5, 6, 7 and 8.

PART J4 * * * * *

This Part has deliberately been left blank.

PART J5 AIR-CONDITIONING AND VENTILATION SYSTEMS

Deemed-to-Satisfy Provisions

J5.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **JP1** and **JP3** are satisfied by complying with—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

J5.1 * * * * *

This clause has deliberately been left blank.

J5.2 Air-conditioning and ventilation systems

(a) An *air-conditioning* unit or system must—

(i) be capable of being deactivated when the *sole-occupancy unit*, building or part of the building served is not occupied; and

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(ii) where the *air-conditioning* unit or system has motorised outside air and return dampers, close the dampers when the *air-conditioning* unit or system is deactivated; and

(iii) when serving a *sole-occupancy unit* of a Class 3 building, not operate when any external door including a door opening to a balcony, patio, courtyard or the like is open for more than 1 minute; and

(iv) have any supply and return ductwork sealed and insulated in accordance with **Specification J5.2**; and

(v) when serving more than one *air-conditioning* zone or area with different heating and cooling needs—

(A) thermostatically control the temperature of each zone or area; and

(B) not control the temperature by mixing actively heated air and actively cooled air; and

(C) limit reheating to not more than—

(aa) for a fixed supply air rate, a 7.5 K rise in temperature; and

(bb) for a variable supply air rate, a 7 5 K rise in temperature at the nominal supply air rate but increased or decreased at the same rate that the supply air rate is respectively decreased or increased; and

(vi) other than where a packaged *air-conditioning* unit is used, have a variable speed fan when its supply air quantity is varied; and

(vii) where the *air-conditioning* system provides the *required* mechanical ventilation, in other than process related applications where humidity control is needed, have an *outdoor air economy cycle*—

(A) in *climate zone* 2 and 3, when the *air-conditioning* unit capacity is over 50 kWr; and

(B) in *climate zones* 4, 5, 6, 7 and 8, when the *air-conditioning* unit capacity is over 35 kWr; and

(viii) in a Class 3 building, be capable of controlling the temperature of a *sole-occupancy unit* at a different temperature during sleeping periods than during other periods; and

(ix) be designed so that the total *fan power* of the *air-conditioning* supply air and return air fans in the building, divided by the *floor area* served by those fans is, in accordance with **Table J5.2**, except the following need not comply with this requirement:

(A) fans in unducted *air-conditioning* units with a supply air capacity of less than 1000 L/s,

(B) The power for a fan in an energy reclaiming system that preconditions outdoor air.

(C) The power for process related components such as high efficiency particulate air filters.

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Table J5.2 MAXIMUM FAN POWER

Air-conditioning **sensible heat load** (**W/m^2 of the *floor area* of the *conditioned space***)	**Maximum *fan power* (W/m^2 of the *floor area* of the *conditioned space*)**	
	For an *air-conditioning* system serving not more than 500 m^2	**For an *air-conditioning* system serving more than 500 m^2**
Up to 100	4.1	6.4
101 to 150	7.3	10.4
151 to 200	10.5	14.1
201 to 300	17.1	21.5
301 to 400	23.6	28.4

Notes: For more than 400 W/m^2 sensible heat load—

(a) in a building of not more than 500 m^2 *floor area*, use 0.07 W of *fan power* for each Watt of internal load; and

(b) in a building of more than 500 m^2 *floor area*, use 0.09 W of *fan power* for each Watt of internal load.

(b) A system that provides mechanical ventilation to other than a *sole-occupancy unit* in a Class 2 building or a Class 4 part of a building, either as part of an *air-conditioning* system or as a separate ventilation system, must—

(i) be capable of being deactivated when the building or part of the building served by that system is not occupied; and

(ii) when serving a *conditioned space*—

(A) not provide mechanical ventilation in excess of the minimum *outdoor air* quantity *required* by **Part F4** for a mechanical ventilation system, where relevant, by more than 20% other than where there is—

(aa) additional unconditioned outside air supplied to provide free cooling or to balance process exhaust such as from a *health-care building* or laboratory; or

(bb) additional exhaust ventilation needed to balance the *required* mechanical ventilation; or

(cc) an energy reclaiming system that preconditions all the outside air; and

(B) in other than *climate zone* 2, where the number of square metres per person is 1 or less as specified in **D1.13** and the air flow rate is more than 1000 L/s, have—

(aa) an energy reclaiming system that preconditions outside air; or

(bb) the ability to automatically modulate the mechanical ventilation *required* by **Part F4** in proportion to the number of occupants; and

(iii) when the mechanical ventilation is provided by means other than an *air-conditioning* system and the air flow rate is more than 1000 L/s—

(A) have a *fan power* to air flow rate ratio of 0.5 W/(L/s) without filters or 0.75 W/(L/s) with filters for a general mechanical ventilation system; and

(B) for *carpark* exhaust, when serving a *carpark* with more than 40 vehicle spaces, be controlled by an atmospheric contaminant monitoring system in accordance with AS 1668.2.

(c) The requirements of **(a)** and **(b)** must not inhibit—

(i) the smoke hazard management operation of *air-conditioning* and mechanical ventilation systems; and

(ii) essential ventilation such as for a garbage room, lift motor room, gas meter enclosure or gas regulator enclosure or the like.

(d) The provisions of **(b)(iii)** do not apply to the following:

(i) The power for an energy reclaiming system that preconditions outside air.

(ii) The power for process related components such as high efficiency particulate air filters.

(iii) The power for a miscellaneous exhaust system complying with **J5.5**.

(iv) The power for a mechanical ventilation system for a Class 8 *electricity network substation*.

J5.3 Time switch

(a) A time switch in accordance with **Specification J6** must be provided to control each of the following:

(i) An *air-conditioning* system of more than 10 kWr.

(ii) A ventilation system with an air flow rate of more than 1000 L/s.

(iii) A heating system of more than 10 $kW_{heating}$.

(b) The requirements of **(a)** do not apply to—

(i) an *air-conditioning* system or ventilation system that serves only one *sole-occupancy unit* of—

(A) a Class 2 or 3 building; or

(B) a Class 4 part of a building; or

(C) a Class 9c *aged care building*; or

(ii) a building where *air-conditioning* or ventilation is needed for 24 hour occupancy such as a manufacturing process or emergency services; or

(iii) a Class 8 *electricity network substation*.

J5.4 Heating and cooling systems

(a) Systems that provide heating or cooling for *air-conditioning* systems must—

(i) have any *piping*, vessels, heat exchangers or tanks containing heated or chilled fluid, other than those with insulation levels covered by Minimum Energy Performance Standards (MEPS), insulated in accordance with **Specification J5.4**; and

(ii) where water is circulated by pumping at greater than 2 L/s—

(A) be designed so that the total of the *pump power* to the pump is in accordance with **Table J5.4a**; and

Table J5.4a MAXIMUM PUMP POWER

Cooling or heating load (W/m^2 of the *floor area* of the *conditioned space*)	Maximum *pump power* (W/m^2 of the *floor area* of the *conditioned space*)		
	Chilled water	Condenser water	Heating water
Up to 100	1.3	0.9	1.0
101 to 150	1.9	1.2	1.3
151 to 200	2.2	2.2	1.7
201 to 300	4.3	3.0	2.5
301 to 400	5.0	3.6	3.2
More than 400	5.6	5.6	3.6

(B) have the pump capable of varying its speed in response to varying load when it is rated at more than 3 kW of *pump power*, except where the pump is needed to run at full speed for safe or efficient operation; and

(iii) if the system contains more than one water heater used for heating a building, chiller or coil, be capable of stopping the flow of water to those not operating.

(b) A heater—

(i) for heating a space via water, such as a boiler, that is part of an *air-conditioning* system, must—

(A) achieve a thermal efficiency complying with **Table J5.4b** when tested in accordance with BS 7190; and

(B) use reticulated gas where it is available at the allotment boundary; and

Table J5.4b MINIMUM THERMAL EFFICIENCY OF A WATER HEATER

Fuel type	Rated capacity ($kW_{heating}$)	Minimum gross thermal efficiency (%)
Gas	Not more than 750	80
	More than 750	83
Oil	All capacities	80

(ii) for heating a space other than via water, must be—

(A) a solar heater; or

(B) a gas heater; or

(C) an oil heater, but only if reticulated gas is not available at the allotment boundary; or

(D) a heat pump heater; or

(E) a solid-fuel burning heater; or

(F) a heater using reclaimed heat from another process such as reject heat from a refrigeration plant; or

(G) a combination of **(A)** to **(F)**; or

(H) electric only—

(aa) if the heating capacity is not more than—

(AA) 10 W/m^2 of the *floor area* of the *conditioned space* in *climate zone* 1; or

(BB) 40 W/m^2 of the *floor area* of the *conditioned space* in *climate zone* 2; or

(CC) the value specified in **Table J5.4c** where reticulated gas is not available at the allotment boundary; or

(bb) if the annual energy consumption for heating is not more than 15 kWh/m^2 of the *floor area* of the *conditioned space* in *climate zones* 1 to 5; or

(cc) if for an in-duct heater complying with **J5.2(a)(v)(C)**; and

Table J5.4c MAXIMUM ELECTRIC HEATING CAPACITY IF RETICULATED GAS IS NOT AVAILABLE AT THE ALLOTMENT BOUNDARY

Floor area* of the *conditioned space	***Climate zone***				
	3	**4**	**5**	**6**	**7**
	W/m^2 of *floor area*				
Not more than 500 m^2	50	60	55	65	70
More than 500 m^2	40	50	45	55	60

(iii) that is a fixed space heating appliance installed outdoors, must be controlled to automatically turn off when not needed by an outdoor air temperature sensor, timer, motion detector, or the like.

(c) Package *air-conditioning* equipment with a capacity of not less than 65 kWr, including a split unit and a heat pump, must have an energy efficiency ratio when cooling complying with **Table J5.4d** when tested in accordance with AS/NZS 3823.1.2 at test condition T1.

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Table J5.4d MINIMUM ENERGY EFFICIENCY RATIO FOR PACKAGED AIR-CONDITIONING EQUIPMENT

Equipment	Minimum energy efficiency ratio ($W_r/W_{input\ power}$)	
	65 kWr to 95 kWr capacity	More than 95 kWr capacity
Air-conditioner — cooling	2.70	2.80
Heat pump — cooling	2.60	2.70

(d) A refrigerant chiller up to 350 kWr capacity that is part of an *air-conditioning* system, must have an energy efficiency ratio complying with **Table J5.4e** when determined in accordance with AHRI 550/590.

Table J5.4e MINIMUM ENERGY EFFICIENCY RATIO FOR REFRIGERANT CHILLERS

Equipment	Minimum energy efficiency ratio ($W_r/W_{input\ power}$)	
	For full load operation	For integrated part load
Water cooled chiller	4.2	5.2
Air cooled or evaporatively cooled chiller	2.5	3.4

(e) The fan motor of an air cooled condenser that is part of an *air-conditioning* system, other than one that is part of package *air-conditioning* equipment in **(c)** or that is part of a Liquid Chilling Package, using the vapour compression cycle in **(d)**, must not use more than 42 W of *fan power*, for each kW of heat rejected from the refrigerant when determined in accordance with AHRI 460.

(f) The fan of a cooling tower that is part of an *air-conditioning* system must not use more than—

(i) if a propeller or axial fan, 310 W of *fan power* for each L/s of cooling water circulated; or

(ii) if a centrifugal fan, 590 W of *fan power* for each L/s of cooling water circulated.

(g) The fan of a closed circuit cooler that is part of an *air-conditioning* system must not use more than—

(i) if a propeller or axial fan, 500 W of *fan power* for each L/s of cooled fluid circulated; and

(ii) if a centrifugal fan, 670 W of *fan power* for each L/s of cooled fluid circulated.

(h) The fan of an evaporative condenser that is part of an *air-conditioning* system must not use more than—

(i) if a propeller or axial fan, 18 W of *fan power* for each kW of heat rejected; and

(ii) if a centrifugal fan, 22 W of *fan power* for each kW of heat rejected.

(i) The spray water pump of a closed circuit cooler or evaporative condenser that is part of an *air-conditioning* system must not use more than 150 W of *pump power* for each L/s of spray water circulated.

J5.5 Miscellaneous exhaust systems

(a) A miscellaneous exhaust system with an air flow rate of more than 1000 L/s, that is associated with equipment having a variable demand such as a stove in a commercial kitchen or a chemical bath in a factory, must—

(i) have the means for the operator to—

(A) reduce the energy used, such as by a variable speed fan, and

(B) stop the motor when the system is not needed; and

(ii) be designed to minimise the exhausting of conditioned air.

(b) The requirements of **(a)** do not apply—

(i) within a *sole-occupancy unit* of a Class 2 or 3 building, Class 4 part of a building or Class 9c *aged care building*; or

(ii) where additional exhaust ventilation is needed to balance the *required* outside air for ventilation; or

(iii) where air flow must be maintained for safe operation; or

(iv) to a Class 8 *electricity network substation*.

PART J6 ARTIFICIAL LIGHTING AND POWER

Deemed-to-Satisfy Provisions

J6.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **JP1** and **JP3** are satisfied by complying with—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**,

the relevant *Performance Requirements* must be determir in accordance with **A0.10**.

J ENERGY EFFICIENCY

J6.1 Application of Part

J6.2, **J6.3** and **J6.5(a)(ii)** do not apply to a Class 8 *electricity network substation*.

J6.2 Artificial lighting

(a) In a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building—

(i) the *lamp power density* or *illumination power density* of artificial lighting must not exceed—

(A) within the building, 5 W/m^2; and

(B) on a verandah or balcony of the building 4 W/m^2; and

(ii) the *illumination power density* in **(i)** may be increased by dividing it by the *illumination power density* adjustment factor for a control device in **Table J6.2b**; and

(iii) when designing the *lamp power density* or *illumination power density*, the power of the proposed installation must be used rather than nominal allowances for exposed batten holders or luminaires; and

(iv) halogen lamps must be separately switched from fluorescent lamps.

b) In a building other than a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building—

(i) for artificial lighting, the aggregate design illumination power load must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum *illumination power density* in **Table J6.2a**; and

(ii) the aggregate design illumination power load in **(i)** is the sum of the design illumination power loads in each of the spaces served; and

(iii) in determining the design illumination power load for **(ii)** the following must be used:

(A) Where there are multiple lighting systems serving the same space—

(aa) the total illumination power load of all systems; or

(bb) for a control system that permits only one system to operate at a time, the design illumination power load is—

(AA) based on the highest illumination power load; or

(BB) determined by the formula—

$$[H \times T/2 + P \times (100 - T/2)] / 100$$

Where:

H = the highest illumination power load; and

T = the time for which the maximum illumination power load will occur, expressed as a percentage; and

P = the predominant illumination power load.

(B) Where there is adjustable position lighting such as trapeze lighting or track lighting other than trunking systems that accept fluorescent lamps—

(aa) the rating of the circuit breaker protecting the track; or

(bb) of extra low voltage, 80% of the power rating of the transformer; or

(cc) of mains voltage, 100 W per metre of track.

c) The requirements of **(a)** and **(b)** do not apply to the following:

(i) Emergency lighting in accordance with **Part E4**.

(ii) Signage and display lighting within cabinets and display cases that are fixed in place.

(iii) Lighting for accommodation within the residential part of a *detention centre*.

(iv) A heater where the heater also emits light, such as in bathrooms.

(v) Lighting of a specialist process nature such as in an operating theatre, fume cupboard or clean workstation.

(vi) Lighting of performances such as theatrical or sporting.

(vii) Lighting for the permanent display and preservation of works of art or objects in a museum or gallery other than for retail sale, purchase or auction.

Table J6.2a MAXIMUM ILLUMINATION POWER DENSITY

Space	Maximum *illumination power density* (W/ m^2)
Auditorium, church and public hall	10
Board room and conference room	10
Carpark - general	6
Carpark - entry zone (first 20 m of travel)	25
Common rooms, spaces and corridors in a Class 2 building	8
Control room, switch room, and the like	9
Corridors	8
Courtroom	12
Dormitory of a Class 3 building used for sleeping only	6
Dormitory of a Class 3 building used for sleeping and study	9
Entry lobby from outside the building	15
Health-care - children's ward	10
Health-care - examination room	10
Health-care - patient ward	7
Health-care - all patient care areas including corridors where cyanosis lamps are used	13
Kitchen and food preparation area	8
Laboratory - artificially lit to an ambient level of 400 lx or more	12
Library - stack and shelving area	12
Library - reading room and general areas	10

Deemed-to-Satisfy Provisions

Table J6.2a MAXIMUM ILLUMINATION POWER DENSITY (Continued)

Space	Maximum *illumination power density* (W/m^2)
Lounge area for communal use in a Class 3 building or Class 9c *aged care building*	10
Museum and gallery - circulation, cleaning and service lighting	8
Office - artificially lit to an ambient level of 200 lx or more	9
Office - artificially lit to an ambient level of less than 200 lx	7
Plant room	5
Restaurant, café, bar, hotel lounge and a space for the serving and consumption of food or drinks	18
Retail space including a museum and gallery whose purpose is the sale of objects	22
School - general purpose learning areas and tutorial rooms	8
Sole-occupancy unit of a Class 3 building	5
Sole-occupancy unit of a Class 9c *aged care building*	7
Storage with shelving no higher than 75% of the height of the aisle lighting	8
Storage with shelving higher than 75% of the height of the aisle lighting	10
Service area, cleaner's room and the like	5
Toilet, locker room, staff room, rest room and the like	6
Wholesale storage and display area	10

Notes:

1. In areas not listed above, the maximum *illumination power density* is—
   (a) for an illuminance of not more than 80 lx, 7.5 W/m^2; and
   (b) for an illuminance of more than 80 lx and not more than 160 lx, 9 W/m^2; and
   (c) for an illuminance of more than 160 lx and not more than 240 lx, 10 W/m^2; and
   (d) for an illuminance of more than 240 lx and not more than 320 lx, 11 W/m^2; and
   (e) for an illuminance of more than 320 lx and not more than 400 lx, 12 W/m^2; and
   (f) for an illuminance of more than 400 lx and not more than 480 lx, 13 W/m^2; and
   (g) for an illuminance of more than 480 lx and not more than 540 lx, 14 W/m^2; and
   (h) for an illuminance of more than 540 lx and not more than 620 lx, 15 W/m^2.
2. For illuminance levels greater than 620 lx, the average *light source efficacy* must not be less than 80 Lumens/W.

Deemed-to-Satisfy Provisions

Table J6.2a MAXIMUM ILLUMINATION POWER DENSITY (Continued)

Space	Maximum *illumination power density* (W/m^2)
3. For enclosed spaces with a Room Aspect Ratio of less than 1.5, the maximum *illumination power density* may be increased by dividing it by an adjustment factor for room aspect which is: 0.5 + (Room Aspect Ratio/3) The Room Aspect Ratio of the enclosed space is determined by the formula: A/(H x C) Where: A is the area of the enclosed space H is the height of the space measured from the floor to the highest part of the ceiling C is the perimeter of the enclosed space at floor level 4. In addition to 3, the maximum *illumination power density* may be increased by dividing it by the *illumination power density* adjustment factor in **Table J6.2b** where applicable and where the control device is not installed to comply with **J6.3**. 5. Circulation spaces are included in the allowances listed in the Table.	

Table J6.2b ILLUMINATION POWER DENSITY ADJUSTMENT FACTOR FOR A CONTROL DEVICE

Item	Description	*Illumination power density* adjustment factor
Lighting timer in accordance with **Specification J6**	For corridor lighting	0.7
Motion detector in accordance with **Specification J6**	(a) Where— (i) at least 75% of the area of a space is controlled by one or more motion detectors; or (iii) an area of less than 200 m^2 is switched as a block by one or more detectors.	0.9
	(b) Where up to 6 lights are switched as a block by one or more detectors.	0.7
	(c) Where up to 2 lights are switched as a block by one or more detectors.	0.55

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Table J6.2b ILLUMINATION POWER DENSITY ADJUSTMENT FACTOR FOR A CONTROL DEVICE (Continued)

Item	Description	*Illumination power density* adjustment factor
Manual dimming system[Note 1]	(a) Where at least 75% of the area of a space, in other than a *sole-occupancy unit* of a Class 2 building or a Class 4 part, is controlled by manually operated dimmers.	0.95
	(b) Where at least 75% of the area of a space, in a *sole-occupancy unit* of a Class 2 building or a Class 4 part, is controlled by manually operated dimmers.	0.85
Programmable dimming system [Note 2]	Where at least 75% of the area of a space is controlled by programmable dimmers.	0.85
Dynamic dimming system [Note 3]	Automatic compensation for lumen depreciation.	The design lumen depreciation factor of not less than— (i) for fluorescent lights, 0.9; or (ii) for high pressure discharge lights, 0.8.
Fixed dimming [Note 4]	Where at least 75% of the area is controlled by fixed dimmers that reduce the overall lighting level and the power consumption of the lighting.	% of full power to which the dimmer is set divided by 0.95.
Daylight sensor and dynamic lighting control device in accordance with **Specification J6** – dimmed or stepped switching of lights adjacent *windows*	(a) Lights within the space adjacent to *windows* other than *roof lights* for a distance from the *window* equal to the depth of the floor to window head height.	0.5 [Note 5]
	(b) Lights within the space adjacent to *roof lights*.	0.6 [Note 5]

Notes:

1. Manual dimming is where lights are controlled by a knob, slider or other mechanism or where there are pre-selected scenes that are manually selected.

Table J6.2b ILLUMINATION POWER DENSITY ADJUSTMENT FACTOR FOR A CONTROL DEVICE (Continued)

Item	Description	*Illumination power density* adjustment factor
2. Programmed dimming is where pre-selected scenes or levels are automatically selected by the time of day, photoelectric cell or occupancy sensor. 3. Dynamic dimming is where the lighting level is varied automatically by a photoelectric cell to either proportionally compensate for the availability of daylight or the lumen depreciation of the lamps. 4. Fixed dimming is where lights are controlled to a level and that level cannot be adjusted by the user. 5. The *illumination power density* adjustment factor is only applied to lights controlled by that item. This adjustment factor does not apply to tungsten halogen or other incandescent sources. 6. A maximum of two other *illumination power density* adjustment factors for a control device can be applied to an area. Where more than one *illumination power density* adjustment factor (other than for room aspect) apply to an area, they are to be combined using the following formula: A x (B + [(1 - B) / 2]) Where: A is the lowest applicable *illumination power density* adjustment factor; and B is the second lowest applicable *illumination power density* adjustment factor.		

J6.3 Interior artificial lighting and power control

(a) Artificial lighting of a room or space must be individually operated by a switch or other control device.

(b) An occupant activated device, such as a room security device, a motion detector in accordance with **Specification J6**, or the like, must be provided in the *sole-occupancy unit* of a Class 3 building, other than where providing accommodation for people with a disability or the aged, to cut power to the artificial lighting, air-conditioner, local exhaust fans and bathroom heater when the *sole-occupancy unit* is unoccupied.

(c) An artificial lighting switch or other control device in **(a)** must—

(i) if an artificial lighting switch, be located in a visible position—

(A) in the room or space being switched; or

(B) in an adjacent room or space from where the lighting being switched is visible; and

(ii) for other than a single functional space such as an auditorium, theatre, *swimming pool*, sporting stadium or warehouse—

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(A) not operate lighting for an area of more than 250 m^2 if in a Class 5 building or a Class 8 laboratory; or

(B) not operate lighting for an area of more than—

(aa) 250 m^2 for a space of not more than 2000 m^2; or

(bb) 1000 m^2 for a space of more than 2000 m^2,

if in a Class 3, 6, 7, 8 (other than a laboratory) or 9 building.

(d) 95% of the light fittings in a building or *storey* of a building, other than a Class 2 or 3 building or a Class 4 part, of more than 250 m^2 must be controlled by—

(i) a time switch in accordance with **Specification J6**; or

(ii) an occupant sensing device such as—

(A) a security key card reader that registers a person entering and leaving the building; or

(B) a motion detector in accordance with **Specification J6**.

(e) In a Class 5, 6 or 8 building of more than 250 m^2, artificial lighting in a natural lighting zone adjacent to windows must be separately controlled from artificial lighting not in a natural lighting zone in the same *storey* except where—

(i) the room containing the natural lighting zone is less than 20 m^2; or

(ii) the room's natural lighting zone contains less than 4 luminaires; or

(iii) 70% or more of the luminaires in the room are in the natural lighting zone.

(f) The requirements of **(a)**, **(b)**, **(c)**, **(d)** and **(e)** do not apply to the following:

(i) Emergency lighting in accordance with **Part E4**.

(ii) Where artificial lighting is needed for 24-hour occupancy such as for a manufacturing process, parts of a hospital, an airport control tower or within a *detention centre*.

(g) The requirements of **(d)** do not apply to the following:

(i) Artificial lighting in a space where the sudden loss of artificial lighting would cause an unsafe situation such as in a *patient care area* in a Class 9a building or in a Class 9c *aged care building*.

(ii) A heater where the heater also emits light, such as in bathrooms.

J6.4 Interior decorative and display lighting

(a) Interior decorative and display lighting, such as for a foyer mural or art display, must be controlled—

(i) separately from other artificial lighting; and

(ii) by a manual switch for each area other than when the operating times of the displays are the same in a number of areas such as in a museum, art gallery or the like, in which case they may be combined; and

(iii) by a time switch in accordance with **Specification J6** where the display lighting exceeds 1 kW.

(b) Window display lighting must be controlled separately from other display lighting.

J6.5 Artificial lighting around the perimeter of a building

(a) Artificial lighting around the perimeter of a building, must—

(i) be controlled by—

(A) a daylight sensor; or

(B) a time switch that is capable of switching on and off electric power to the system at variable pre-programmed times and on variable pre-programmed days; and

(ii) when the total perimeter lighting load exceeds 100 W—

(A) have an average *light source efficacy* of not less than 60 Lumens/W, or

(B) be controlled by a motion detector in accordance with **Specification J6**; and

(iii) when used for decorative purposes, such as facade lighting or signage lighting, have a separate time switch in accordance with **Specification J6**.

(b) The requirements of **(a)(ii)** do not apply to the following:

(i) Emergency lighting in accordance with **Part E4**.

(ii) Lighting around a *detention centre*.

J6.6 Boiling water and chilled water storage units

Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with **Specification J6**.

PART J7 HOT WATER SUPPLY AND SWIMMING POOL AND SPA POOL PLANT

Deemed-to-Satisfy Provisions

J7.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirements* **JP1** and **JP3** are satisfied by complying with—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of—

(i) **J0.1** to **J0.3**; and

(ii) **J1.1** to **J1.6**; and

(iii) **J2.1** to **J2.5**; and

(iv) **J3.1** to **J3.7**; and

(v) **J5.1** to **J5.5**; and

(vi) **J6.1** to **J6.6**; and

(vii) **J7.1** to **J7.4**,

the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

SA J7.0(c)

J7.1 * * * * *

This clause has been deliberately left blank.

Deemed-to-Satisfy Provisions

J7.2 Hot water supply

SA J7.2

Vic J7.2

A hot water supply system for food preparation and sanitary purposes, other than a solar hot water supply system in *climate zones* 1, 2 and 3, must be designed and installed in accordance with Section 8 of AS/NZS 3500.4.

J7.3 Swimming pool heating and pumping

(a) Heating for a *swimming pool* must be by—

(i) a solar heater not boosted by electric resistance heating; or

(ii) a heater using reclaimed energy; or

(iii) a gas heater; or

(iv) a heat pump; or

(v) a combination of 2 or more of **(i)**, **(ii)**, **(iii)** and **(iv)**.

(b) Where some or all of the heating *required* by **(a)** is by a gas heater or a heat pump, the *swimming pool* must have—

(i) a cover other than when located in a *conditioned space*; and

(ii) a time switch in accordance with **Specification J6** to control the operation of the heater.

(c) A time switch must be provided in accordance with **Specification J6** to control the operation of a circulation pump for a *swimming pool*.

(d) For the purpose of **J7.3**, a *swimming pool* does not include a spa pool.

J7.4 Spa pool heating and pumping

(a) Heating for a spa pool that shares a water recirculation system with a *swimming pool* must be by—

(i) a solar heater; or

(ii) a heater using reclaimed energy; or

(iii) a gas heater; or

(iv) a heat pump; or

(v) a combination of 2 or more of **(i)**, **(ii)**, **(iii)** and **(iv)**.

(b) Where some or all of the heating *required* by **(a)** is by a gas heater or a heat pump, the spa pool must have—

(i) a cover; and

(ii) a push button and a time switch in accordance with **Specification J6** to control the operation of the heater.

Deemed-to-Satisfy Provisions

(c) A time switch must be provided in accordance with **Specification J6** to control the operation of a circulation pump for a spa pool having a capacity of 680 L or more.

SA J7.5

PART J8 ACCESS FOR MAINTENANCE AND FACILITIES FOR MONITORING

Deemed-to-Satisfy Provisions

J8.0 Deemed-to-Satisfy Provisions

(a) Where a *Building Solution* is proposed to comply with the *Deemed-to-Satisfy Provisions*, *Performance Requirement* **JP2** is satisfied by complying with **J8.1** to **J8.3**.

(b) Where a *Building Solution* is proposed as an *Alternative Solution* to the *Deemed-to-Satisfy Provisions* of **J8.1** to **J8.3**, the relevant *Performance Requirements* must be determined in accordance with **A0.10**.

J8.1 Application of Part

The *Deemed-to-Satisfy Provisions* of this Part do not apply—

(a) within a *sole-occupancy unit* of a Class 2 building or a Class 4 part of a building; or

(b) to a Class 8 *electricity network substation*.

J8.2 Access for maintenance

NSW J8.2

Access must be provided to all plant, equipment and components that *require* maintenance in accordance with **Part I2**.

J8.3 Facilities for energy monitoring

(a) A building or *sole-occupancy unit* with a *floor area* of more than 500 m^2 must have the facility to record the consumption of gas and electricity.

(b) A building with a *floor area* of more than 2,500 m^2 must have the facility to record individually the energy consumption of—

(i) *air-conditioning* plant including, where appropriate, heating plant, cooling plant and air handling fans; and

(ii) artificial lighting; and

(iii) appliance power; and

(iv) central hot water supply; and

(v) internal transport devices including lifts, escalators and travelators where there is more than one serving the building; and

(vi) other ancillary plant.

(c) The provisions of **(b)** do not apply to a Class 2 building with a *floor area* of more than 2,500 m^2 where the total area of the common areas is less than 500 m^2.

SPECIFICATION J1.2 MATERIAL PROPERTIES

Deemed-to-Satisfy Provisions

1. Scope

This Specification lists the thermal properties of some common construction materials.

2. Construction Deemed-to-Satisfy

(a) **Table 2a** lists the thermal conductivity considered to be achieved by some common construction materials.

Table 2a THERMAL CONDUCTIVITY OF TYPICAL WALL, ROOF/CEILING AND FLOOR MATERIALS

Material description		Material density kg/ m^3	Thermal conductivity W/m.K
1.	**Framing**		
(a)	Steel	7850	47.5
(b)	Timber – kiln dried hardwood (across the grain)	677	0.16
(c)	Timber – Radiata pine (across the grain)	506	0.10
2.	**Roof Cladding**		
(a)	Aluminium sheeting	2680	210
(b)	Concrete or terra cotta tiles	1922	0.81
(c)	Steel sheeting	7850	47.5
3.	**Wall Cladding**		
(a)	Aluminium sheeting	2680	210
(b)	Autoclaved aerated concrete	350	0.10
		900	0.27
(c)	Cement render (1 cement : 4 sand)	1570	0.53
(d)	Clay bricks		
	(i) Clay brick – 2.75 kg	1430	0.55
	(ii) Clay brick – 3.25 kg	1690	0.65
	(iii) Clay brick – 3.75 kg	1950	0.78
(e)	Concrete blocks		
	(i) 190 mm dense or 90 mm dense solid	1100/2200	1.1
	(ii) 140 mm dense or 190 mm lightweight	1250/910	0.85

Deemed-to-Satisfy Provisions

Table 2a THERMAL CONDUCTIVITY OF TYPICAL WALL, ROOF/CEILING AND FLOOR MATERIALS (Continued)

Material description		Material density kg/ m^3	Thermal conductivity W/m.K
(iii)	90 mm dense hollow or 90 mm lightweight solid	1650/1800	0.75
(iv)	140 mm lightweight	1050	0.67
(v)	90 mm lightweight	1360	0.55
(f)	Fibre-cement	1360	0.25
(g)	Gypsum plasterboard	880	0.17
(h)	Pine weatherboards	506	0.10
(i)	Plywood	530	0.14
(j)	Solid concrete	2400	1.44
(k)	Steel sheeting	7850	47.5
(l)	Prestressed hollow core concrete panel	1680	0.80
4.	**Flooring Materials**		
(a)	Carpet underlay	-	0.04
(b)	Carpet	-	0.05
(c)	Prestressed hollow core concrete planks	1680	0.80
(d)	Particleboard	640	0.12
(e)	Plywood	530	0.14
(f)	Timber – kiln dried hardwood (across the grain)	677	0.16
(g)	Timber – Radiata pine (across the grain)	506	0.10
(h)	Solid concrete	2400	1.44
(i)	Vinyl floor tiles	2050	0.79
5.	**Other Materials**		
(a)	Clay soil (10% moisture content)	1300	0.6
(b)	PMMA (polymethylmethacrylate)	1180	1.00
(c)	Polycarbonates	1200	0.2
(d)	Sand (6% moisture content)	1800	1.64
(e)	Soda lime glass	2500	1.0

Deemed-to-Satisfy Provisions

Table 2a THERMAL CONDUCTIVITY OF TYPICAL WALL, ROOF/CEILING AND FLOOR MATERIALS (Continued)

Material description	Material density kg/ m^3	Thermal conductivity W/m.K
Notes: 1. For materials which incorporate cores or hollows in regular patterns (such as cored brickwork, hollow blockwork and cored floor or wall panels), the tabulated material densities and thermal conductivities are based on the gross density (mass divided by external dimensions). 2. The *R-Value* of a material is determined by dividing the thickness of the material in metres by the thermal conductivity in W/m.K.		

(b) **Table 2b** lists the *R-Values* considered to be achieved by air films and airspaces.

Table 2b TYPICAL R-VALUES FOR AIRSPACES AND AIR FILMS

Position of airspace	Direction of heat flow	*R-Value*
1. Airspaces non-reflective unventilated		
In a roof with a pitch of not more than 5°	Up	0.15
	Down	0.22
In a roof with a ceiling that is parallel with a roof with a pitch more than 5° and not more than 15°	Up	0.15
	Down	0.21
In a roof with a ceiling that is parallel with a roof with a pitch more than 22° and not more than 45°	Up	0.15
	Down	0.18
In any roof space with a horizontal ceiling, with a pitch more than 5°	Up	0.18
	Down	0.28
In a wall	Horizontal	0.17
2. Airspaces non-reflective ventilated		
In any roof with a pitch not more than 5° and 100 mm deep airspace	Up	Nil
	Down	0.19
In any roof space with a horizontal ceiling, with a pitch more than 5°	Up	Nil
	Down	0.46
In a wall	Horizontal	0.14
3. Air films – Still air		
On a surface with a pitch of not more than 5°	Up	0.11
	Down	0.16

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Table 2b TYPICAL R-VALUES FOR AIRSPACES AND AIR FILMS (Continued)

Position of airspace	Direction of heat flow	*R-Value*
On a surface with a pitch of more than 5° and not more than 30°	Up	0.11
	Down	0.15
On a surface with a pitch of more than 30° and not more than 45°	Up	0.11
	Down	0.13
On a wall	Horizontal	0.12
4. Air films – Moving air		
Not more than 3 m/s wind	Any direction	0.04
More than 3 m/s wind speed and not more than 7 m/s wind speed	Any direction	0.03
Note: *R-Values* are for a temperature of 10°C and temperature difference of 15K.		

(c) The thermal properties considered to be achieved by reflective surfaces are—

(i) within a wall—

(A) with an inner reflective surface of 0.05 emittance and a 20 mm airspace to the wall lining, an added *R-Value* of 0.48; and

(B) with an inner reflective surface of 0.05 emittance and a 70 mm airspace to the wall lining, an added *R-Value* of 0.43; and

(C) with an inner reflective surface of 0.05 emittance and a 70 mm airspace to the wall lining and an outer anti-glare reflective surface of 0.20 emittance and a 25 mm airspace to the wall cladding, an added *R-Value* of 0.95; and

(D) with an outer anti-glare reflective surface of 0.20 emittance and a 35 mm airspace to the wall cladding, an added *R-Value* of 0.50; and

(ii) within a roof where the *reflective insulation* is laid directly under the roof, those in **Table 2c**.

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Table 2c TYPICAL THERMAL PROPERTIES FOR REFLECTIVE SURFACES WITH AIRSPACES IN ROOFS

Emittance of added *reflective insulation*	Direction of heat flow	*R-Value* added by a reflective surface					
		Pitched roof (>10°) with horizontal ceiling		Flat, skillion or pitched roof (≤10°) with horizontal ceiling	Pitched roof with cathedral ceiling		
		Ventilated roof space	Non-ventilated roof space		15° to not more than 25° pitch	more than 25° to not more than 35° pitch	more than 35° to 45° pitch
0.2 outer 0.05 inner	Downwards	1.21	1.12	1.28	0.96	0.86	0.66
0.2 outer 0.05 inner	Upwards	0.59	0.75	0.68	0.72	0.74	0.77
0.9 outer 0.05 inner	Downwards	1.01	0.92	1.06	0.74	0.64	0.44
0.9 outer 0.05 inner	Upward	0.40	0.55	0.49	0.51	0.52	0.53

(d) A ventilated roof space is a roof space with—

(i) gable vents, ridge vents, eave vents, roof vents or the like that—

(A) are evenly distributed to allow an unobstructed flow of air; and

(B) are located to ensure, where practicable, there are no dead airspaces; and

(C) have an aggregate fixed open area of not less than 1.0% of the ceiling area; or

(ii) not less than 2 wind-driven roof ventilators having an aggregate opening area of not less than 0.14 m^2 in conjunction with gable vents, ridge vents, eave vents, roof vents or the like having an aggregate fixed open area of not less than 0.2% of the ceiling area; or

(iii) a tiled roof without *sarking-type material* at roof level.

SPECIFICATION J1.3 ROOF AND CEILING CONSTRUCTION

Deemed-to-Satisfy Provisions

1. Scope

This Specification describes the thermal performance of some common forms of roof and ceiling construction.

2. Construction Deemed-to-Satisfy

Figure 2 details the *R-Values* considered to be achieved by some common forms of roof and ceiling construction.

Figure 2 TYPICAL R-VALUES FOR ROOF AND CEILING CONSTRUCTION

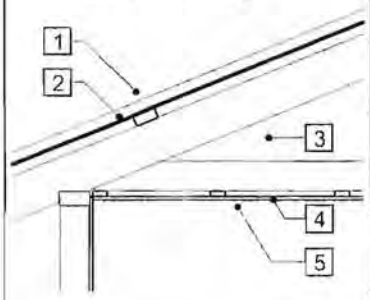
Roof construction description	Item	Item description	*R-Value* Unventilated		*R-Value* Ventilated	
			Up	Down	Up	Down
(a) Roof 15° to 45° pitch – Horizontal ceiling – Metal cladding 	1.	Outdoor air film (7 m/s)	0.04	0.04	0.04	0.04
	2.	Metal cladding	0.00	0.00	0.00	0.00
	3.	Roof airspace (non-reflective)	0.18	0.28	0.00	0.46
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06	0.06	0.06	0.06
	5.	Indoor air film (still air)	0.11	0.16	0.11	0.16
		Total R-Value	0.39	0.54	0.21	0.72

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Figure 2 TYPICAL R-VALUES FOR ROOF AND CEILING CONSTRUCTION (Continued)

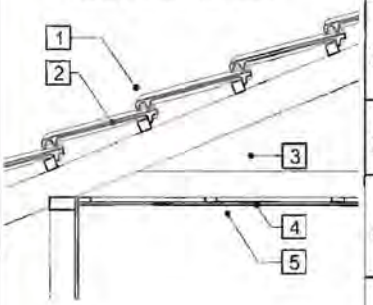
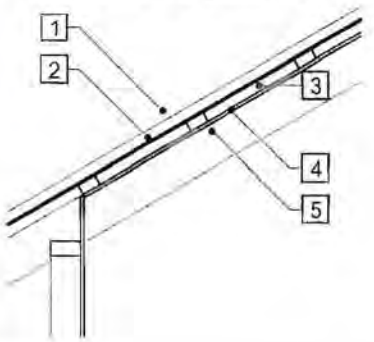
Roof construction description	Item	Item description	*R-Value* Unventilated		*R-Value* Ventilated	
			Up	Down	Up	Down
(b) Roof 15° to 45° pitch – Horizontal ceiling – Clay tiles 19 mm 	1.	Outdoor air film (7 m/s)	0.04	0.04	0.04	0.04
	2.	Roof tile, clay or concrete (1922 kg/m^3)	0.02	0.02	0.02	0.02
	3.	Roof airspace (non-reflective)	0.18	0.28	0.00	0.46
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06	0.06	0.06	0.06
	5.	Indoor air film (still air)	0.11	0.16	0.11	0.16
		Total R-Value	0.41	0.56	0.23	0.74

Figure 2 TYPICAL R-VALUES FOR ROOF AND CEILING CONSTRUCTION

Roof construction description	Item	Item description	*R-Value* Unventilated	
			Up	Down
(c) Cathedral ceiling 15° to 45° pitch – 10 mm plaster on top of rafters – Metal external cladding 	1.	Outdoor air film (7 m/s)	0.04	0.04
	2.	Metal cladding	0.00	0.00
	3.	Roof airspace (30 mm to 100 mm, non-reflective)	0.15	0.18
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06	0.06
	5.	Indoor air film (still air)	0.11	0.14
		Total R-Value	0.36	0.42

Deemed-to-Satisfy Provisions

Figure 2 TYPICAL R-VALUES FOR ROOF AND CEILING CONSTRUCTION (Continued)

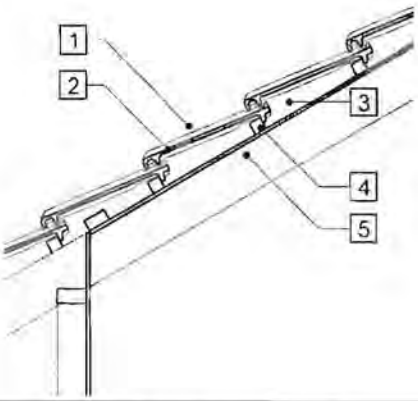
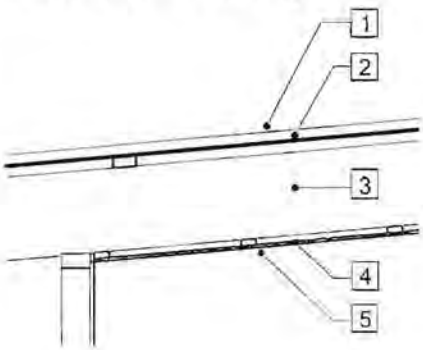
Roof construction description	Item	Item description	*R-Value* Unventilated	
			Up	Down
(d) Cathedral ceiling 15° to 45° pitch – 10 mm plaster on top of rafters – Tiles external cladding  	1.	Outdoor air film (7 m/s)	0.04	0.04
	2.	Roof tile, clay or concrete (1922 kg/m^3)	0.02	0.02
	3.	Roof airspace (30 mm to 100 mm, non-reflective)	0.15	0.18
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06	0.06
	5.	Indoor air film (still air)	0.11	0.14
		Total R-Value	0.38	0.44
(e) Skillion roof less than 5° pitch – 10 mm plaster below rafters – Metal external cladding  	1.	Outdoor air film (7 m/s)	0.04	0.04
	2.	Metal cladding	0.00	0.00
	3.	Roof airspace (100 mm to 300 mm, non-reflective)	0.15	0.22
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06	0.06
	5.	Indoor air film (still air)	0.11	0.16
		Total R-Value	0.36	0.48

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Figure 2 TYPICAL R-VALUES FOR ROOF AND CEILING CONSTRUCTION (Continued)

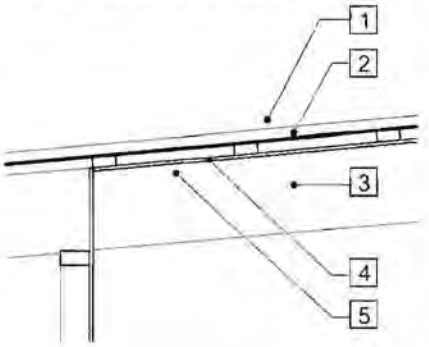
Roof construction description	Item	Item description	*R-Value* Unventilated	
			Up	Down
(f) Skillion roof 5° to 15° pitch – 10 mm plaster on top of rafters – Metal external cladding 	**1.**	Outdoor air film (7 m/s)	0.04	0.04
	2.	Metal cladding	0.00	0.00
	3.	Roof airspace (30 mm to 100 mm non-reflective)	0.15	0.21
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06	0.06
	5.	Indoor air film (still air)	0.11	0.16
		Total R-Value	0.36	0.47

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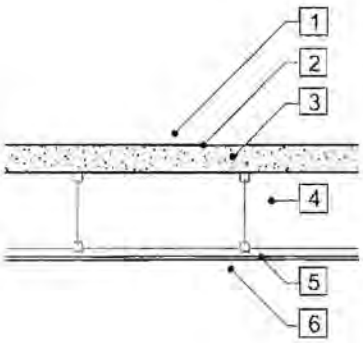
Figure 2 TYPICAL R-VALUES FOR ROOF AND CEILING CONSTRUCTION (Continued)

Roof construction description	Item	Item description	*R-Value* Unventilated	
			Up	Down
(g) 100 mm solid concrete roof to 5° – 10 mm plaster, suspended ceiling – Applied external waterproof membrane  	**1.**	Outdoor air film (7 m/s)	0.04	0.04
	2.	Waterproof membrane, rubber synthetic (4 mm, 961 kg/m^3)	0.03	0.03
	3.	Solid concrete, (100 mm, 2400 kg/m^3)	0.07	0.07
	4.	Ceiling airspace (100 mm to 300 mm, non-reflective)	0.15	0.22
	5.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06	0.06
	6.	Indoor air film (still air)	0.11	0.16
		Total R-Value	0.46	0.58

Notes:

1. The *R-Value* of an item, other than an airspace, air film or air cavity, may be increased in proportion to the increased thickness of the item.
2. The *Total R-Value* of a form of construction may be increased by the amount that the *R-Value* of an individual item is increased.
3. Where an airspace is filled, the *R-Value* listed for the airspace must be deducted from the *Total R-Value* of the roof construction.
4. For information on a roof space that is considered to be ventilated, see **Specification J1.2, Clause 2(d)**.

SPECIFICATION J1.5 WALL CONSTRUCTION

Deemed-to-Satisfy Provisions

1. Scope

This Specification describes the thermal performance of some common forms of external wall construction.

2. Construction Deemed-to-Satisfy

Figure 2 details the *R-Values* considered to be achieved by some common forms of wall construction.

Figure 2 TYPICAL R-VALUES FOR WALL CONSTRUCTION

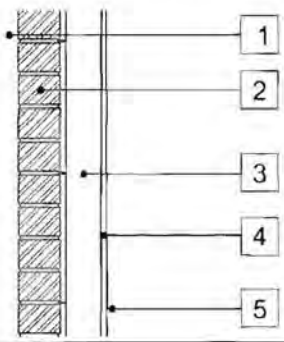
External wall construction description	Item	Item description	*R-Value*
(a) Masonry veneer – 25 mm to 50 mm cavity, 10 mm internal plaster on 90 mm stud frame 	1.	Outdoor air film (7 m/s)	0.04
	2.	Masonry (See notes 3 and 4)	0.09
	3.	Cavity and airspace (115 to 140 mm, made up of 90 mm stud + 25 mm to 50 mm airspace non-reflective and unventilated)	0.17
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06
	5.	Indoor air film (still air)	0.12
		Total R-Value	0.48

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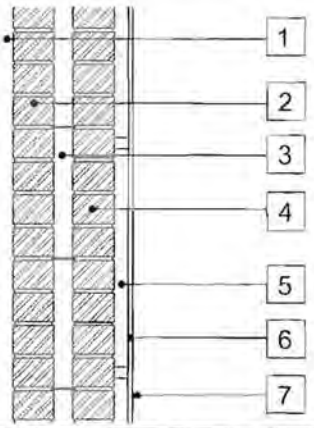
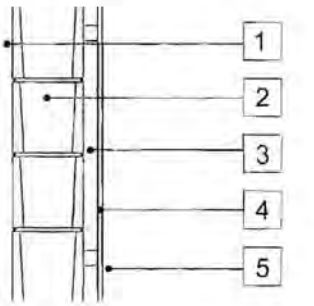
Figure 2 TYPICAL R-VALUES FOR WALL CONSTRUCTION (Continued)

External wall construction description	Item	Item description	*R-Value*
(b) Cavity masonry – 20 mm to 50 mm cavity, 10 mm internal plaster on battens or furring channels 	1.	Outdoor air film (7 m/s)	0.04
	2.	Masonry (See notes 3 and 4)	0.09
	3.	Masonry cavity (20 mm to 50 mm, non-reflective and unventilated)	0.17
	4.	Masonry (See note 4)	0.09
	5.	Airspace (20 mm to 35 mm, non-reflective and unventilated)	0.17
	6.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06
	7.	Indoor air film (still air)	0.12
		Total R-Value	0.74
(c) Dense weight hollow concrete block with internal plaster on battens or furring channels 	1.	Outdoor air film (7 m/s)	0.04
	2.	Dense weight hollow concrete block (See notes 3 and 4)	0.15
	3.	Airspace (20 mm to 40 mm non-reflective and unventilated)	0.17
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06
	5.	Indoor air film (still air)	0.12
		Total R-Value	0.54

Deemed-to-Satisfy Provisions

Figure 2 TYPICAL R-VALUES FOR WALL CONSTRUCTION (Continued)

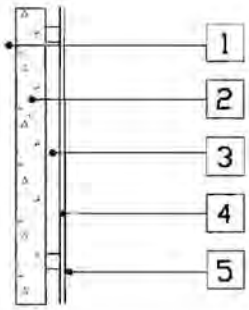
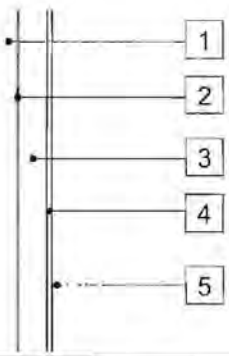
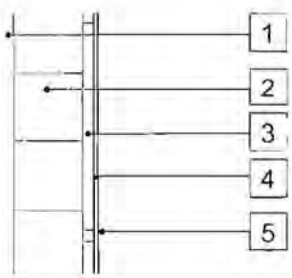
External wall construction description	Item	Item description	*R-Value*
(d) 125 mm solid reinforced concrete (dense weight) – 10 mm internal plaster on battens or furring channels 	1.	Outdoor air film (7 m/s)	0.04
	2.	125 mm minimum solid reinforced concrete (See note 3)	0.09
	3.	Airspace (20 mm to 40 mm non-reflective and unventilated)	0.17
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06
	5.	Indoor air film (still air)	0.12
		Total R-Value	0.48
(e) Timber wall – external 6 mm cement sheet cladding, 90 mm stud frame, 10 mm plaster 	1.	Outdoor air film (7 m/s)	0.04
	2.	Fibre-cement (6 mm, 1360 kg/m^3)	0.03
	3.	Airspace (90 mm nonreflective and unventilated)	0.17
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06
	5.	Indoor air film (still air)	0.12
		Total R-Value	0.42
(f) 200 mm autoclaved aerated concrete block – 10 mm internal plaster on battens or furring channels 	1.	Outdoor air film (7 m/s)	0.04
	2.	Autoclaved aerated concrete block (200 mm, 350 kg/m^3)	2.00
	3.	Airspace (20 mm to 40 mm non-reflective and unventilated)	0.17
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06
	5.	Indoor air film (still air)	0.12
		Total R-Value	2.39

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Figure 2 TYPICAL R-VALUES FOR WALL CONSTRUCTION (Continued)

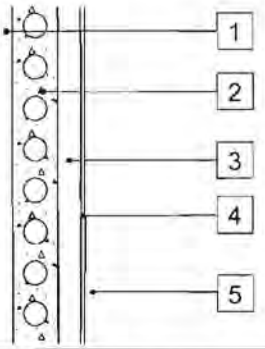
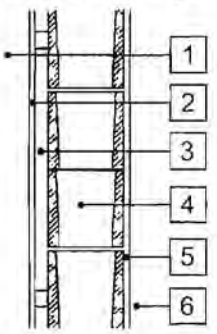
External wall construction description	Item	Item description	*R-Value*
(g) 150 mm hollow-core concrete panels – 10 mm internal plaster on battens or furring channels 	1.	Outdoor air film (7 m/s)	0.04
	2.	Prestressed hollow-core concrete panels (150 mm, 1,680 kg/m^3, 30% cores)	0.14
	3.	Airspace (20 mm to 40 mm non-reflective and unventilated)	0.17
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06
	5.	Indoor air film (still air)	0.12
		Total R-Value	0.53
(h) Dense weight hollow concrete block with external 6 mm cement sheet cladding on battens or furring channels 	1.	Outdoor air film (7 m/s)	0.04
	2.	Fibre-cement (6 mm, 1360 kg/m^3)	0.03
	3.	Airspace (20 mm to 40 mm non-reflective and unventilated)	0.17
	4.	Dense weight hollow concrete block (See note 4)	0.15
	5.	10 mm render	0.02
	6.	Indoor air film (still air)	0.12
		Total R-Value	0.53

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Figure 2 TYPICAL R-VALUES FOR WALL CONSTRUCTION (Continued)

External wall construction description	Item	Item description	*R-Value*

Notes:

1. The *R-Value* of an item, other than an airspace, air film or air cavity, may be increased in proportion to the increased thickness of the item.
2. The *Total R-Value* of a form of construction may be increased by the amount that an individual item is increased.
3. The addition of 10 mm of render to a concrete or masonry wall will increase the *Total R-Value* by 0.02.
4. (a) The typical *R-Value* in Figure 2(a) and (b) is for 90 mm dense weight concrete block.

   (b) The typical *R-Value* in Figure 2(c) and (h) is for 140 mm dense weight hollow concrete block.

   (c) The typical *R-Value* in Figure 2(d) is for 125 mm solid reinforced concrete (2400 kg/m^3).

   (d) Other typical *R-Values* for masonry and concrete are as follows and may be substituted for those above:

90 mm clay brick:	
(density 1430 kg/m^3)	0.16
(density 1690 kg/m^3)	0.14
(density 1950 kg/m^3)	0.12
110 mm clay brick:	
(density 1430 kg/m^3, 2.75 kg/brick)	0.20
(density 1690 kg/m^3, 3.25 kg/brick)	0.17
(density 1950 kg/m^3, 3.75 kg/brick)	0.14
Dense weight hollow concrete block:	
110 mm	0.12
190 mm	0.20

5. The *Total R-Values* in this Figure are for *external walls*. The *Total R-Value* for an internal wall of the same construction would be 0.08 greater because the *R-Value* for an outdoor air film would be replaced by that of an indoor air film.
6. Where a cavity or airspace is filled, the *R-Value* listed for the cavity must be deducted from the *Total R-Value* of the wall.

SPECIFICATION J1.6 FLOOR CONSTRUCTION

Deemed-to-Satisfy Provisions

1. Scope

This Specification describes the thermal performance of some common forms of floor construction.

2. Construction Deemed-to-Satisfy

Figure 2 details the *R-Values* considered to be achieved by some common forms of floor construction, other than a concrete floor with an embedded floor heating system.

Figure 2 TYPICAL R-VALUES FOR FLOOR CONSTRUCTION (for a floor without a floor heating system)

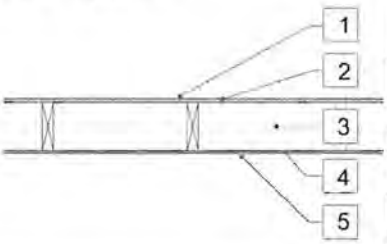
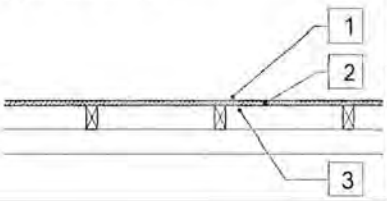
Floor construction description	Item	Item description	*R-Value*	
			Up	Down
(a) Timber internal floor, 10 mm internal plaster 	1.	Indoor air film (still air)	0.11	0.16
	2.	Particleboard flooring (19 mm, 640 kg/m^3)	0.15	0.15
	3.	Floor airspace, 100 mm to 300 mm (non reflective)	0.15	0.22
	4.	Plasterboard, gypsum (10 mm, 880 kg/m^3)	0.06	0.06
	5.	Indoor air film (still air)	0.11	0.16
		Total R-Value	0.58	0.75
(b) Timber, suspended ground floor, open sub-floor 	1.	Indoor air film (still air)	0.11	0.16
	2.	Particleboard flooring (19 mm, 640 kg/m^3)	0.15	0.15
	3.	Outdoor air film (7 m/s)	0.04	0.04
		Total R-Value	0.30	0.35

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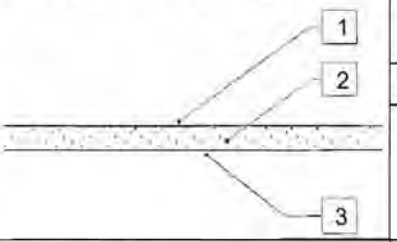
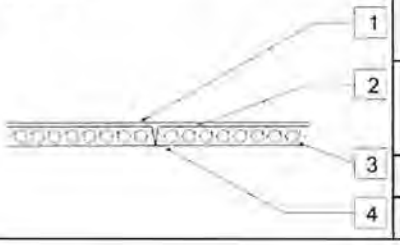
Figure 2 TYPICAL R-VALUES FOR FLOOR CONSTRUCTION (for a floor without a floor heating system) (Continued)

Floor construction description	Item	Item description	*R-Value*	
			Up	Down
(c) Solid concrete suspended slab 	1.	Indoor air film (still air)	0.11	0.16
	2.	Solid concrete (150 mm, 2400 kg/m^3)	0.10	0.10
	3.	Outdoor air film (7 m/s)	0.04	0.04
		Total R-Value	0.25	0.30
(d) 150 mm hollow-core concrete planks 	1.	Indoor air film (still air)	0.11	0.16
	2.	Concrete topping (60 mm, 2,400 kg/m^3)	0.04	0.04
	3.	Hollow-core concrete planks (150 mm, 1,680 kg/m^3, 30% cores)	0.14	0.14
	4.	Outdoor air film (7 m/s)	0.04	0.04
		Total R-Value	0.33	0.38

Notes:

1. The *R-Value* of an item, other than an airspace, air film or air cavity, may be increased in proportion to the increased thickness of the item.
2. The *Total R-Value* of a form of construction may be increased by the amount that an individual item is increased.
3. For floor types (c) and (d) that are located over an internal space, the *Total R-Value* can be calculated by replacing the value for outdoor air film (R0.04) on the underside of the floor with the value for indoor air film (R0.11 for heat flow up or R0.16 for heat flow down).
4. For floor types (b), (c) and (d) located over ground with an enclosed perimeter, the *Total R-Value* can be calculated by replacing the value for outdoor air film (R0.04) on the underside of the floor with the value for indoor air film plus ground thermal resistance (i.e. R0.11+R0.56=R0.67 for heat flow up, or R0.16+R0.58=R0.74 for heat flow down).
5. Where reflective building membrane is attached beneath the floor with a 100 mm reflective airspace, add R0.38 for heat flow up and R1.14 for heat flow down.
6. Where ground floor construction with an enclosed perimeter makes the airspace adjacent to the ground reflective, the face down sub-floor air films will be R0.23 instead of R0.11 for heat flow up, and R0.80 instead of R0.16 for heat flow down.
7. The addition of 10 mm of render to the ceiling of a suspended internal concrete floor will increase the *Total R-Value* by 0.02.
8. Solid concrete slab includes concrete beam and infill floors and concrete precast permanent formwork panels.

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Figure 2 TYPICAL R-VALUES FOR FLOOR CONSTRUCTION (for a floor without a floor heating system) (Continued)

Floor construction description	Item	Item description	*R-Value*	
			Up	Down
9. Where an airspace is filled, the *R-Value* listed for the airspace must be deducted from the *Total R-Value* of the floor construction.				

SPECIFICATION J5.2 DUCTWORK INSULATION AND SEALING

Deemed-to-Satisfy Provisions

1. Scope

This Specification contains the requirements for the sealing and the insulating of supply and return ductwork used in a system that heats or cools a building.

2. Ductwork sealing

(a) Heating or cooling ductwork and fittings must be sealed against air loss—

(i) by closing all openings in the surface, joints and seams of ductwork with adhesives, mastics, sealants or gaskets in accordance with the duct sealing requirements of AS 4254 for the static pressure in the system; or

(ii) for flexible ductwork at an operating static pressure of less than 500 Pa, with a draw band in conjunction with a sealant or adhesive tape.

(b) The requirements of **(a)** do not apply to ductwork and fittings located within the only or last room that is served by the system.

3. Ductwork insulation

(a) Insulation must be provided on ductwork and fittings, used for heating or cooling, including evaporative cooling, with insulation complying with AS/NZS 4859.1 and—

(i) achieve the material *R-Value* specified in **Table 3**; or

(ii) for flexible ductwork of no more than 3 m in length to an outlet or from an inlet, achieve a minimum material *R-Value* of 1.0.

(b) Insulation on ductwork conveying cold air must be protected by—

(i) a vapour barrier on the outside of the insulation; and

(ii) where the vapour barrier is a membrane, overlapping adjoining sheets of the membrane by 50 mm and bonding or taping the sheets together.

(c) Ductwork insulation must—

(i) be protected against the effects of weather and sunlight; and

(ii) abut adjoining insulation to form a continuous barrier; and

(iii) be installed so that it maintains its position and thickness, other than at flanges and supports.

(d) The requirements of **(a)** do not apply to—

(i) heating and cooling ductwork and fittings located within the only or last room that is served by the system; and

(ii) air registers, diffusers, outlets, grilles and flexible fan connections; and

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(iii) return air ductwork in, or passing through, a *conditioned space*; and

(iv) ductwork for outside air and exhaust air associated with a heating or cooling system; and

(v) the floor of an in-situ air-handling unit; and

(vi) packaged air-conditioning equipment complying with Minimum Energy Performance Standard (MEPS).

Table 3 DUCTWORK AND FITTINGS - MINIMUM MATERIAL R-VALUE

Location of ductwork and fittings	**Minimum material *R-Value* for ductwork and fittings in each *climate zone***		
	1, 2, 3 and 5	**4, 6 and 7**	**8**
Within a *conditioned space*	1.2	1.2	1.6
Where exposed to direct sunlight	3.0	3.0	3.4
All other locations	2.0	2.0	2.4

SPECIFICATION J5.4 INSULATING OF PIPING, VESSELS, HEAT EXCHANGERS AND TANKS

Deemed-to-Satisfy Provisions

1. Scope

(a) This Specification contains the requirements for the insulating of *piping*, vessels, heat exchangers and tanks containing heating fluids or cooling fluids.

(b) For the purposes of this Specification—

(i) heating fluids include hot water, steam and condensate; and

(ii) cooling fluids include refrigerant, chilled water and brines and glycol mixtures, but not condenser cooling water to or from a cooling tower.

2. Insulation

(a) Insulation provided on piping, vessels, heat exchangers and tanks must comply with AS/NZS 4859.1 and—

(i) be protected against the effects of weather and sunlight; and

(ii) be able to withstand the temperatures within the *piping*, vessel, heat exchanger or tank; and

(iii) for—

(A) heating water and cooling water *piping*, achieve the material *R-Value* in **Table 2a**; and

(B) refrigerant, steam and condensate *piping*, achieve the material *R-Value* in **Table 2b**; and

(iv) for vessels, heat exchangers and tanks, achieve a minimum material *R-Value* of—

(A) 2.7 if the content is refrigerant, low temperature brine or glycol that is not more than 2°C; or

(B) 1.8 if the content is refrigerant cooling water that is more than 2°C but not more than 20°C; or

(C) 1.4 if the content is heating water; or

(D) 2.5 if the content is steam.

(b) Insulation on *piping*, vessels, heat exchangers and tanks containing chilled fluid must be protected by a vapour barrier on the outside of the insulation.

(c) The requirements of **(a)** do not apply to *piping*—

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(i) located within the *conditioned space* where the *piping*, and fittings which provide heating and cooling to that space are located within the last or only room that is served by the system; or

(ii) encased within a concrete slab or panel which is part of a heating or cooling system; or

(iii) supplied as an integral part of a piece of plant; or

(iv) inside an air-handling unit, fan-coil unit or the like.

Table 2a WATER PIPING - MINIMUM MATERIAL R-VALUE

Location	Minimum material *R-Value* for each *climate zone*		
	1, 2, 3 and 5	4, 6 and 7	8
1. Heating water *piping* for systems of not more than 65 $kW_{heating}$ capacity			
(a) Located internally	1.0	1.0	1.3
(b) Located within a wall space, an enclosed sub-floor area or an enclosed roof space	1.1	1.1	1.4
(c) Located outside the building, an unenclosed sub-floor area or an unenclosed roof space	1.2	1.2	1.5
2. Heating water *piping* for systems of more than 65 $kW_{heating}$ capacity			
(a) Located internally	1.0	1.0	1.7
(b) Located within a wall space, an enclosed sub-floor area or an enclosed roof space	1.1	1.1	1.8
(c) Located outside the building or in an unenclosed sub-floor area or an unenclosed roof space	1.2	1.5	1.9
3. Cooling water *piping* for systems of not more than 65 kW_r capacity			
(a) Located internally	1.0	0.6	0.6
(b) Located within a wall space, an enclosed sub-floor area or an enclosed roof space	1.1	0.7	0.7
(c) Located outside the building or in an unenclosed sub-floor area or an unenclosed roof space	1.2	0.8	0.8
4. Cooling water *piping* for systems of more than 65 kW_r capacity but not more than 250 kW_r capacity			
(a) Located internally	1.7	1.3	1.0
(b) Located within a wall space, an enclosed sub-floor area or an enclosed roof space	1.8	1.4	1.1
(c) Located outside the building or in an unenclosed sub-floor area or an unenclosed roof space	1.9	1.5	1.2

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Table 2a WATER PIPING - MINIMUM MATERIAL R-VALUE (Continued)

Location	Minimum material *R-Value* for each *climate zone*		
	1, 2, 3 and 5	4, 6 and 7	8
5. Cooling water *piping* for systems of more than 250 kW$_r$ capacity			
(a) Located internally	2.0	1.7	1.3
(b) Located within a wall space, an enclosed sub-floor area or an enclosed roof space	2.1	1.8	1.4
(c) Located outside the building or in an unenclosed sub-floor area or an unenclosed roof space	2.2	1.9	1.5

Note:

1. *Piping* to be insulated includes all flow and return *piping*, cold water supply *piping* within 500 mm of the connection to the heating or cooling system and pressure relief *piping* within 500 mm of the connection to the heating or cooling system.
2. For *piping* diameters of not more than 32 mm, for the last 750 mm adjoining items of plant, the insulation material *R-Value* may be—
   (a) halved; or
   (b) reduced to R0.6 where local clearances do not allow insulation to be installed in accordance with (a).
3. For *piping* penetrating a structural member, the insulation material *R-Value* may be halved.

Table 2b REFRIGERANT, STEAM AND CONDENSATE PIPING— MINIMUM MATERIAL R-VALUE

Temperature range	Nominal pipe size				
	15 mm to 40 mm	50 mm to 80 mm	100 mm to 125 mm	150 mm	200 mm
Refrigerant not more than 2°C	1.3	1.7	2.0	2.0	2.7
Refrigerant more than 2°C but not more than 20°C	As for cooling water in **Table 2a**				
Steam and condensate not more than 120°C	1.0	1.0	1.3	1.3	1.3
Steam more than 120°C	1.5	1.5	1.5	1.8	2.1

SPECIFICATION J6 LIGHTING AND POWER CONTROL DEVICES

Deemed-to-Satisfy Provisions

1. Scope

This Specification contains the requirements for lighting and power control devices including timers, time switches, motion detectors and daylight control devices.

2. Lighting timers

A lighting timer must—

(a) be located within 2 m of every entry door to the space; and

(b) have an indicator light that is illuminated when the artificial lighting is off; and

(c) not control more than—

(i) an area of 100 m^2 with a single push button timer; and

(ii) 95% of the lights in spaces of area more than 25 m^2; and

(d) be capable of maintaining the artificial lighting—

(i) for not less than 5 minutes and not more than 15 minutes unless it is reset; and

(ii) without interruption if the timer is reset.

3. Time switch

(a) A time switch must be capable of switching on and off electric power at variable pre-programmed times and on variable pre-programmed days.

(b) A time switch for internal lighting must be capable of being overridden by—

(i) a means of turning the lights on, either by—

(A) a manual switch or an occupant sensing device that on sensing a person's presence, overrides the time switch for a period of up to 2 hours, after which there is no further presence detected, the time switch must resume control; or

(B) an occupant sensing device that overrides the time switch upon a person's entry and returns control to the time switch upon the person's exiting, such as a security card reader; and

(ii) a manual "off" switch.

(c) A time switch for external lighting must be capable of—

(i) limiting the period the system is switched on to between 30 minutes before sunset and 30 minutes after sunrise is determined or detected including any pre-programmed period between these times; and

(ii) being overridden by a manual switch or a security access system for a period of up to 30 minutes, after which the time switch must resume control.

(d) A time switch for boiling water and chilled water storage units must be capable of being overridden by a manual switch or a security access system that senses a person's presence, overrides for a period of up to 2 hours, after which if there is no further presence detected, the time switch must resume control.

4. Motion detectors

(a) In a Class 2, 3 or 9c *aged care building* other than within a *sole-occupancy unit*, a motion detector must—

(i) be capable of sensing movement such as by infra-red, ultrasonic or microwave detection or by a combination of these means; and

(ii) be capable of detecting a person before they are 1 m into the space; and

(iii) other than within a *sole-occupancy unit* of a Class 3 building, not control more than—

(A) an area of 100 m^2; and

(B) 95% of the lights in spaces of area more than 25 m^2; and

(iv) be capable of maintaining the artificial lighting when activated—

(A) for not less than 5 minutes and not more than 15 minutes unless it is reset; and

(B) without interruption if the motion detector is reset by movement.

(b) In a Class 5, 6, 7, 8, 9a or 9b building, a motion detector must—

(i) be capable of sensing movement such as by infra-red, ultrasonic or microwave detection or by a combination of these means; and

(ii) be capable of detecting—

(A) a person before they have entered 1 m into the space; and

(B) movement of 500 mm within the useable part of the space; and

(iii) not control more than—

(A) in other than a *carpark*, an area of 500 m^2 with a single sensor or group of parallel sensors; and

(B) 75% of the lights in spaces using high intensity discharge; and

(iv) be capable of maintaining the artificial lighting when activated—

(A) for a maximum of 30 minutes unless it is reset; and

(B) without interruption if the motion detector is reset by movement; and

(v) not be overridden by a manual switch to permanently leave the lights on.

(c) When outside a building, a motion detector must—

(i) be capable of sensing movement such as by infra-red, ultrasonic or microwave detection or by a combination of these means; and

(ii) be capable of detecting a person within a distance from the light equal to—

(A) twice the mounting height; or

(B) 80% of the ground area covered by the light's beam; and

(iii) not control more than five lights; and

(iv) be operated in series with a photoelectric cell or astronomical time switch so that the light will not operate in daylight hours; and

(v) be capable of maintaining the artificial lighting when the switch is on for a maximum of 10 minutes unless it is reset; and

(vi) have a manual override switch which is reset after a maximum period of 4 hours.

5. Daylight sensor and dynamic lighting control device

(a) A daylight sensor and dynamic control device for artificial lighting must—

(i) for switching on and off—

(A) be capable of having the switching level set point adjusted between 50 and 1000 Lux; and

(B) have—

(aa) a delay of more than 2 minutes; and

(bb) a differential of more than 100 Lux for a sensor controlling high pressure discharge lighting, and 50 Lux for a sensor controlling other than high pressure discharge lighting; and

(ii) for dimmed or stepped switching, be capable of reducing the power consumed by the controlled lighting in proportion to the incident daylight on the working plane either—

(A) continuously down to a power consumption that is less than 50% of full power; or

(B) in no less than 4 steps down to a power consumption that is less than 50% of full power.

(b) Where a daylight sensor and dynamic control device has a manual override switch, the manual override switch must not be able to switch the lights permanently on or bypass the lighting controls.

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ABBREVIATIONS AND SYMBOLS

Abbreviations and Symbols used in the BCA include:

ABBREVIATIONS

ABCB	Australian Building Codes Board
AISC	Australian Institute of Steel Construction
ALGA	Australian Local Government Association
AS	Australian Standard
ASTM	American Society for Testing and Materials
BCA	Building Code of Australia
BCC	Building Codes Committee
C_{SHGC}	Constant for solar heat gain
CSIRO	Commonwealth Scientific and Industrial Research Organisation
C_U	Constant for conductance
FRL	Fire Resistance Level
GRP	glass fibre reinforced polyester
ISO	International Organisation for Standardisation
NATA	National Association of Testing Authorities
PVC	polyvinyl chloride
R_w	weighted sound reduction index
SHGC	Solar Heat Gain Coefficient
STC	Sound Transmission Class
UPVC	unplasticized polyvinyl chloride
U-Value	Thermal transmittance

SYMBOLS (SI UNITS)

dB(A)	decibels "A" scale weighting network
°C	degree(s) Celsius
°CDB	degree(s) Celsius Dry Bulb
°CWB	degree(s) Celsius Wet Bulb
-e/MJ	equivalent per MegaJoule(s)
J/kg.K	Joules per kilogram per degree Kelvin

$J/s.m^2$	Joules per second per square metre
K	kelvin(s)
kg	kilogram(s)
kg/m	kilogram(s) per metre
kg/m^2	kilogram(s) per square metre
kg/m^3	kilogram(s) per cubic metre
$KJ/hour.m^2$	kiloJoules per hour per square metre
kPa	kilopascal(s)
kW/m^2	kilowatt(s) per square metre
$kW_{heating}$	kilowatt(s) of heating
kWr	kilowatt(s) of refrigeration
L	litre(s)
L/s	litre(s) per second
$L/s.m^2$	litre(s) per second square metre
Lumens/W	Lumens per Watt
lx	lux
m	metre(s)
m^2	square metre(s)
m^3	cubic metre(s)
MJ/hour	MegaJoules per hour
$MJ/m^2.annum$	MegaJoules per square metre annum
m/s	metre(s) per second
m^3/s	cubic metre(s) per second
mm	millimetre(s)
mm^2	square millimetre(s)
µm	micrometre
MW	megawatt(s)
N	newton(s)
Pa	pascal(s)
W	Watt(s)
W/m.K	Watts per metre per degree Kelvin
W/m^2	Watts per square metre

HISTORY OF BCA ADOPTION

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HISTORY OF BCA ADOPTION

1.0 Adoption of BCA96

The 1996 edition of the BCA was adopted as set out in Table Amdt 1.0.

Table 1.0 History of adoption of BCA96

Administration	Adoption Date
Australian Government	1 July 1997
Australian Capital Territory	1 July 1997
New South Wales	1 July 1997
Northern Territory	7 January 1998
Queensland	1 July 1997
South Australia	1 January 1998
Tasmania	1 July 1997
Victoria	1 August 1997
Western Australia	1 July 1997

1.1 Amendment No. 1

(a) Amendment No. 1 of the 1996 edition of the BCA was adopted as set out in Table 1.1.

Table 1.1 History of adoption of Amendment No. 1 of the BCA96

Administration	Adoption Date
Australian Government	1 July 1997
Australian Capital Territory	1 July 1997
New South Wales	1 July 1997
Northern Territory	7 January 1998
Queensland	1 July 1997
South Australia	1 January 1998
Tasmania	1 July 1997
Victoria	1 August 1997
Western Australia	1 July 1997

(b) The purpose of Amendment No. 1 is to—

(i) correct minor typographical errors including spelling, punctuation and layout; and

(ii) include reference to a Certificate of Conformity issued by the ABCB in A2.2; and

(iii) change the reference to the Standards Mark Certificate to refer to JAS–ANZ in A2.2; and

(iv) update references to Standards.

Note:

Only substantive typographical corrections are noted in the margin.

1.2 Amendment No. 2

(a) Amendment No. 2 of the 1996 edition of the BCA was adopted as set out in Table 1.2.

Table 1.2 History of adoption of Amendment No. 2 of the BCA96

Administration	Adoption Date
Australian Government	1 January 1998
Australian Capital Territory	1 January 1998
New South Wales	27 February 1998
Northern Territory	7 January 1998
Queensland	1 January 1998
South Australia	1 January 1998
Tasmania	1 January 1998
Victoria	1 January 1998
Western Australia	1 January 1998

(b) The purpose of Amendment No. 2 is to—

(i) correct minor typographical errors; and

(ii) update references to Standards.

1.3 Amendment No. 3

(a) Amendment No. 3 of the 1996 edition of the BCA was adopted as set out in Table 1.3.

Table 1.3 History of adoption of Amendment No. 3 of the BCA96

Administration	Adoption Date
Australian Government	1 July 1998
Australian Capital Territory	1 July 1998
New South Wales	1 July 1998
Northern Territory	1 July 1998

Table 1.3 History of adoption of Amendment No. 3 of the BCA96 (Continued)

Administration	Adoption Date
Queensland	1 July 1998
South Australia	13 July 1998
Tasmania	1 July 1998
Victoria	1 July 1998
Western Australia	1 July 1998

(b) The purpose of Amendment No. 3 is to—

(i) incorporate the outcomes of the 1997 ABCB Variations Conference; and

(ii) update references to Standards; and

(iii) include minor technical changes.

1.4 Amendment No. 4

(a) Amendment No. 4 of the 1996 edition of the BCA was adopted by the Australian Government, States and Territories as set out in Table 1.4.

Table 1.4 History of adoption of Amendment No. 4 of the BCA96

Administration	Adoption Date
Australian Government	1 January 1999
Australian Capital Territory	17 May 1999
New South Wales	1 February 1999
Northern Territory	1 January 1999
Queensland	1 January 1999
South Australia	1 January 1999
Tasmania	1 January 1999
Victoria	1 January 1999
Western Australia	1 January 1999

(b) The purpose of Amendment No. 4 is to—

(i) update references to Standards; and

(ii) include minor technical changes.

Note:

Only substantive typographical corrections are noted in the margin.

1.5 Amendment No. 5

(a) Amendment No. 5 of the 1996 edition of the BCA was adopted as set out in Table 1.5.

Table 1.5 History of adoption of Amendment No. 5 of the BCA96

Administration	Adoption Date
Australian Government	1 July 1999
Australian Capital Territory	3 November 1999
New South Wales	1 August 1999
Northern Territory	1 July 1999
Queensland	1 July 1999
South Australia	1 July 1999
Tasmania	1 July 1999
Victoria	1 July 1999
Western Australia	1 July 1999

(b) The purpose of Amendment No. 5 is to—

(i) update references to Standards; and

(ii) include minor technical changes; and

(iii) amend clauses to improve clarity and to reduce the possibility of differences in interpretation; and

(iv) expand on the requirements for sub-floor ventilation based on climatic conditions.

Note:

Only substantive typographical corrections are noted in the margin.

1.6 Amendment No. 6

(a) Amendment No. 6 of the 1996 edition of the BCA was adopted as set out in Table 1.6.

Table 1.6 History of adoption of Amendment No. 6 of the BCA96

Administration	Adoption Date
Australian Government	1 January 2000
Australian Capital Territory	10 February 2000
New South Wales	1 January 2000
Northern Territory	1 January 2000
Queensland	1 January 2000
South Australia	17 January 2000
Tasmania	1 January 2000
Victoria	1 January 2000
Western Australia	1 January 2000

(b) The purpose of Amendment No. 6 is to—

(i) update references to Standards; and

(ii) expand on the requirements for carparking for people with disabilities; and

(iii) replace Sound Transmission Class (STC) with weighted sound reduction index (R_w) within Part F5; and

(iv) include minor technical changes.

Note:

Only substantive typographical corrections are noted in the margin

1.7 Amendment No. 7

(a) Amendment No. 7 of the 1996 edition of the BCA was adopted as set out in Table 1.7.

Table 1.7 History of adoption of Amendment No. 7 of the BCA96

Administration	Adoption Date
Australian Government	1 July 2000
Australian Capital Territory	10 July 2000
New South Wales	1 July 2000
Northern Territory	1 July 2000
Queensland	1 July 2000
South Australia	1 July 2000
Tasmania	1 July 2000
Victoria	1 July 2000
Western Australia	1 July 2000

(b) The purpose of Amendment No. 7 is to—

(i) update references to Standards; and

(ii) include requirements for non-required and private stairways; and

(iii) include minor technical changes.

Note:

Only substantive typographical corrections are noted in the margin.

1.8 Amendment No. 8

(a) Amendment No. 8 of the 1996 edition of the BCA was adopted as set out in Table 1.8.

Table 1.8 History of adoption of Amendment No. 8 of the BCA96

Administration	Adoption Date
Australian Government	1 January 2001
Australian Capital Territory	11 January 2001
New South Wales	1 January 2001
Northern Territory	1 January 2001
Queensland	1 January 2001
South Australia	1 January 2001
Tasmania	1 January 2001
Victoria	1 January 2001
Western Australia	1 January 2001

(b) The purpose of Amendment No. 8 is to—

(i) update references to Standards; and

(ii) include minor technical changes; and

(iii) achieve greater consistency between both Volumes of the BCA for stairway construction.

Note:

Only substantive typographical corrections are noted in the margin.

1.9 Amendment No. 9

(a) Amendment No. 9 of the 1996 edition of the BCA was adopted as set out in Table 1.9.

Table 1.9 History of adoption of Amendment No. 9 of the BCA96

Administration	Adoption Date
Australian Government	1 July 2001
Australian Capital Territory	12 July 2001
New South Wales	1 July 2001
Northern Territory	1 July 2001
Queensland	1 July 2001
South Australia	2 July 2001
Tasmania	1 July 2001
Victoria	1 July 2001
Western Australia	1 July 2001

(b) The purpose of Amendment No. 9 is to—

(i) update references to Standards; and

(ii) include minor technical changes; and

(iii) clarify which glazed assemblies must comply with AS 2047 and which must comply with AS 1288.

Note:

Only substantive typographical corrections are noted in the margin.

1.10 Amendment No. 10

(a) Amendment No. 10 of the 1996 edition of the BCA was adopted as set out in Table 1.10.

Table 1.10 History of adoption of Amendment No. 10 of the BCA96

Administration	Adoption Date
Australian Government	1 January 2002
Australian Capital Territory	1 January 2002
New South Wales	1 January 2002
Northern Territory	1 January 2002
Queensland	1 January 2002
South Australia	1 January 2002
Tasmania	1 January 2002
Victoria	1 January 2002
Western Australia	1 January 2002

(b) The purpose of Amendment No. 10 is to—

(i) update references to Standards; and

(ii) clarify that windows must comply with AS 2047 for resistance to water penetration; and

(iii) subject to certain conditions, allow a non-fire-isolated stairway to connect an additional storey; and

(iv) update signage required for people with disabilities, including the need for signs to contain Braille and tactile information; and

(v) include minor technical changes.

Note:

Only substantive typographical corrections are noted in the margin.

1.11 Amendment No. 11

(a) Amendment No. 11 of the 1996 edition of the BCA was adopted as set out in Table 1.11.

Table 1.11 History of adoption of Amendment No. 11 of the BCA96

Administration	Adoption Date
Australian Government	1 July 2002
Australian Capital Territory	1 July 2002
New South Wales	1 July 2002
Northern Territory	1 July 2002
Queensland	1 July 2002
South Australia	1 July 2002
Tasmania	1 July 2002
Victoria	1 July 2002
Western Australia	1 July 2002

(b) The purpose of Amendment No. 11 is to—

(i) update references to Standards; and

(ii) transfer public policy matters, with respect to structural adequacy, from the AS 1170 series to the BCA; and

(iii) introduce Class 7a, 7b and 9c classifications; and

(iv) update the provisions for residential buildings used for the accommodation of the aged to align with the Commonwealth Aged Care Act, 1997; and

(v) include minor technical changes.

Note:

Only substantive typographical corrections are noted in the margin.

1.12 Amendment No. 12

(a) Amendment No. 12 of the 1996 edition of the BCA was adopted as set out in Table 1.12.

Table 1.12 History of adoption of Amendment No. 12 of the BCA96

Administration	Adoption Date
Australian Government	1 January 2003
Australian Capital Territory	1 January 2003
New South Wales	1 January 2003
Northern Territory	1 January 2003
Queensland	1 January 2003
South Australia	1 January 2003
Tasmania	1 January 2003
Victoria	1 January 2003

Table 1.12 History of adoption of Amendment No. 12 of the BCA96 (Continued)

Administration	Adoption Date
Western Australia	1 January 2003

(b) The purpose of Amendment No. 12 is to—

(i) update references to Standards; and

(ii) apply the swimming pool safety provisions to swimming pools associated with Class 4 parts as well as Class 2 and 3 buildings; and

(iii) allow the use of either the 1989 editions or the 2002 editions of the 1170 series of standards; and

(iv) include minor technical changes.

Note:

Only substantive typographical corrections are noted in the margin.

1.13 Amendment No. 13

(a) Amendment No. 13 of the 1996 edition of the BCA was adopted as set out in Table 1.13.

Table 1.13 History of adoption of Amendment No. 13 of the BCA96

Administration	Adoption Date
Australian Government	1 July 2003
Australian Capital Territory	1 July 2003
New South Wales	1 July 2003
Northern Territory	1 July 2003
Queensland	1 July 2003
South Australia	To be advised
Tasmania	1 July 2003
Victoria	1 July 2003
Western Australia	1 July 2003

(b) The purpose of Amendment No. 13 is to—

(i) update references to Standards; and

(ii) reform the provisions for fire hazard properties of materials; and

(iii) revise a requirement for the use of non-combustible materials, and

(iv) include additional requirements for the protection of electrical switchboards which sustain electricity supply to emergency equipment; and

(v) include minor changes to the requirements for aged care buildings; and

(vi) include minor technical changes.

Note:

Only substantive typographical corrections are noted in the margin.

2.0 Adoption of BCA 2004

(a) The 2004 edition of the BCA was adopted as set out in Table 2.0

Table 2.0 History of adoption of BCA 2004

Administration	Adoption Date
Australian Government	1 May 2004
Australian Capital Territory	1 May 2004
New South Wales	1 May 2004
Northern Territory	1 May 2004
Queensland	1 May 2004
South Australia	1 May 2004
Tasmania	1 May 2004
Victoria	1 May 2004
Western Australia	1 May 2004

(b) The purpose of BCA 2004 is to—

(i) update references to Standards; and

(ii) update references from BCA 96 to BCA 2004; and

(iii) include a Performance Requirement considering human impact with glazing; and

(iv) reform the provisions for sound insulation; and

(v) reform the maintenance provisions; and

(vi) include minor technical changes.

3.0 Adoption of BCA 2005

(a) The 2005 edition of the BCA was adopted as set out in Table 3.0

Table 3.0 History of adoption of BCA 2005

Administration	Adoption Date
Australian Government	1 May 2005
Australian Capital Territory	1 May 2005
New South Wales	1 May 2005
Northern Territory	1 May 2005
Queensland	1 May 2005

Table 3.0 History of adoption of BCA 2005 (Continued)

Administration	Adoption Date
South Australia	1 May 2005
Tasmania	1 May 2005
Victoria	1 May 2005
Western Australia	1 May 2005

(b) The purpose of BCA 2005 is to—

(i) update references to Standards; and

(ii) clarify when fire sprinklers are required to be installed in buildings; and

(iii) update the provisions for waterproofing of wet areas; and

(iv) include energy efficiency measures for Class 2 and 3 buildings and Class 4 parts; and

(v) more closely align the requirements for lifts with those of Occupational Health and Safety legislation; and

(vi) include minor technical changes.

4.0 Adoption of BCA 2006

(a) The 2006 edition of the BCA was adopted as set out in Table 4.0.

Table 4.0 History of adoption of BCA 2006

Administration	Adoption Date
Australian Government	1 May 2006
Australian Capital Territory	1 May 2006
New South Wales	1 May 2006 (except that the date for mandatory compliance with Section J provisions for Class 5 to 9 buildings is 1 November 2006)
Northern Territory	1 May 2006
Queensland	1 May 2006
South Australia	1 May 2006, except for Part I2 and Section J which were adopted on 1 August 2006
Tasmania	1 May 2006
Victoria	1 May 2006
Western Australia	1 May 2006

(b) The purpose of BCA 2006 is to—

(i) update schedule of referenced documents; and

(ii) include a national testing regime for cladding in cyclonic areas; and

(iii) withdraw of AS1530.3 tests on floor materials and floor coverings and wall and ceiling linings; and

(iv) include energy efficiency measures for Class 5 to 9 buildings; and

(v) include minor technical changes.

5.0 Adoption of BCA 2007

(a) The 2007 edition of the BCA was adopted by the Commonwealth, States and Territories as set out in Table 5.0.

Table 5.0 History of adoption of BCA 2007

Administration	Adoption Date
Australian Government	1 May 2007
Australian Capital Territory	1 May 2007
New South Wales	1 May 2007
Northern Territory	1 May 2007
Queensland	1 May 2007
South Australia	1 May 2007
Tasmania	1 May 2007
Victoria	1 May 2007
Western Australia	1 May 2007

(b) The purpose of BCA 2007 is to—

(i) update references to other documents; and

(ii) update energy efficiency provisions including providing additional information; and

(ii) include minor technical changes.

6.0 Adoption of BCA 2008

(a) The 2008 edition of the BCA was adopted by the Commonwealth, States and Territories as set out in Table 6.0.

Table 6.0 History of adoption of BCA 2008

Administration	Adoption Date
Australian Government	1 May 2008
Australian Capital Territory	1 May 2008
New South Wales	1 May 2008
Northern Territory	1 May 2008
Queensland	1 May 2008
South Australia	1 May 2008

Table 6.0 History of adoption of BCA 2008 (Continued)

Administration	Adoption Date
Tasmania	1 May 2008
Victoria	1 May 2008
Western Australia	1 May 2008

(b) The purpose of BCA 2008 is to—

(i) update references to other documents; and

(ii) due to changes in the types of detectors now available, rather than only allowing the use of a heat detectors when smoke detector would be unsuitable in the atmosphere, to also allow the use of any type of detector deemed suitable by AS 1670.1; and

(iii) clarify the intent of the BCA when a service penetrates a building element required to have an FRL; and

(iv) amend the requirements for door handle heights to be consistent with AS 1428.1; and

(v) align some BCA terms with current industry terminology; and

(vi) include lists of other Commonwealth, State and Territory legislation affecting buildings; and

(vii) include suitable provisions for swimming pool water recirculation systems; and

(viii) include minor technical changes.

7.0 Adoption of BCA 2009

(a) The 2009 edition of the BCA was adopted by the Commonwealth, States and Territories as set out in Table 7.0.

Table 7.0 History of adoption of BCA 2009

Administration	Adoption Date
Australian Government	1 May 2009
Australian Capital Territory	1 May 2009
New South Wales	1 May 2009
Northern Territory	1 May 2009
Queensland	1 May 2009
South Australia	1 May 2009
Tasmania	1 May 2009
Victoria	1 May 2009
Western Australia	1 May 2009

(b) The purpose of BCA 2009 is to—

(i) update references to other documents; and

(ii) after expiry of the agreed transition period, except for the 1993 edition of AS 1170.4, delete all references to the older loading standards contained in the AS 1170 series and consequently, all provisions referring to them; and

(iii) clarify the application of the vertical separation provisions; and

(iv) clarify the intent of separation of equipment; and

(v) simplify the wire balustrade provisions, including the addition of a *Verification Method*; and

(vi) clarify the provisions for the construction of sanitary compartments to enable an unconscious occupant to be removed; and

(vii) clarify the height of rooms in an attic and with a sloping ceiling; and

(viii) further update the energy efficiency provisions; and

(ix) include minor technical changes.

8.0 Adoption of BCA 2010

(a) The 2010 edition of the BCA was adopted by the Commonwealth, States and Territories as set out in Table 8.0.

Table 8.0 History of adoption of BCA 2010

Administration	Adoption Date
Australian Government	1 May 2010
Australian Capital Territory	1 May 2010
New South Wales	1 May 2010
Northern Territory	1 May 2010
Queensland	1 May 2010
South Australia	1 May 2010 except for Section J, which was adopted on 1 September 2010, and the restriction on child resistant door sets in G1.1 and the additional bushfire requirements for 'excluded areas' prescribed in SA G5.2(d) and (e), which were adopted on 2 December 2010.
Tasmania	1 May 2010
Victoria	1 May 2010
Western Australia	1 May 2010

(b) The purpose of BCA 2010 is to—

(i) update references to other documents; and

(ii) delete reference to the 1993 edition of AS 1170.4 and consequently all provisions referring to it; and

(iii) increase the stringency of the energy efficiency provisions and, as part of reducing greenhouse gas emissions, introduce provisions for the greenhouse gas intensity of the energy source for services such as water and space heaters; and

(iv) update **Part G5**, as a consequence of referencing the 2009 edition of AS 3959 construction in bushfire-prone areas, to include provisions which apply to a Class 10a building or deck associated with a Class 2 or 3 building located in a *designated bushfire prone area*; and

(v) include minor technical changes.

9.0 Adoption of BCA 2011

(a) The 2011 edition of the BCA was adopted by the Commonwealth, States and Territories as set out in **Table 9.0**.

Table 9.0 History of adoption of BCA 2011

Administration	Adoption Date
Australian Government	1 May 2011
Australian Capital Territory	1 May 2011
New South Wales	1 May 2011
Northern Territory	1 May 2011
Queensland	1 May 2011
South Australia	1 May 2011
Tasmania	1 May 2011
Victoria	1 May 2011
Western Australia	1 May 2011

(b) The purpose of BCA 2011 is to—

(i) update references to other documents; and

(ii) align the BCA with the Access Code in the Disability (Access to Premises — Buildings) Standards; and

(iii) restructure the fire hazard property provisions; and

(iv) include minor technical changes.

10.0 Adoption of BCA 2012

(a) The 2012 edition of the BCA was adopted by the Commonwealth, States and Territories as set out in **Table 10.0**.

Table 10.0 History of adoption of BCA 2012

Administration	Adoption Date
Australian Government	1 May 2012
Australian Capital Territory	1 May 2012

Table 10.0 History of adoption of BCA 2012 (Continued)

Administration	Adoption Date
New South Wales	1 May 2012
Northern Territory	1 May 2012
Queensland	1 May 2012
South Australia	1 May 2012
Tasmania	1 May 2012
Victoria	1 May 2012
Western Australia	1 May 2012

(b) The purpose of BCA 2012 is to—

(i) update references to other documents; and

(ii) include revised provisions aimed at reducing slips, trips and falls in buildings; and

(iii) include a Verification Method for emergency lighting; and

(iv) align the BCA with changes to the National Quality Standard for early childhood education and care; and

(v) include exemptions for Class 8 electricity network substations; and

(vi) include minor technical changes.

LIST OF AMENDMENTS

CONTENTS

LIST OF AMENDMENTS - NCC 2012 - VOLUME ONE

This set of notes has been prepared by the Australian Building Codes Board to assist NCC users in identifying changes incorporated in the 2012 edition of Volume One.

The notes provide a description of major changes made from the previous edition of Volume One. If additional information is required to assist in understanding, interpreting or applying the provisions of the 2012 edition of Volume One, reference should be made to the Guide to Volume One.

While the Australian Building Codes Board has attempted to include all major changes made from the previous edition of Volume One, the Board does not give any warranty nor accept any liability in relation to the contents of this list of amendments.

Reference	Changes and Commentary	
Introduction		
Amendments have occurred to the introduction pages to align with changes made to the ABCB Inter-government Agreement.		
Section A		
A1.1	The following definitions have been inserted or amended:	
	Air-conditioning	The definition has been amended to add a service that directly cools or heats a Class 8 electricity network substation to the list of services that the definition does not apply to. The application of the definition will indicate that certain provisions in Section J do not apply.
	Climate zone	Additional clarification has been provided to assist in determining climate Zone 4 and 5 in South Australia.
	Early childhood centre	The definition has been amended as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
	Electricity network substation	A new defined term has been included to describe the electrical transforming or conversion facilities that are granted relevant exemptions.
	House energy rating software	A new defined term has been included to nominate the acceptable accrediting body for software used to assess potential thermal efficiency of a dwelling envelope.
	Private garage	As a consequence of defining the capacity of the exhaust system in terms of vehicle spaces as opposed to vehicles at F4.11, the definition of 'private garage' has been amended for consistency.
	Renewable Energy Certificate	The defined term 'Renewable Energy Certificate' has been deleted as it is no longer referenced in Volume One.

Reference	Changes and Commentary	
	Shower area	A new defined term has been included due to the restructure of F1.7 and the inclusion of Table F1.7.
	Vessel	A new defined term has been included due to the restructure of F1.7 and the inclusion of Table F1.7.
	Waterproof	A new defined term has been included due to the restructure of F1.7 and the inclusion of Table F1.7.
	Water resistant	A new defined term has been included due to the restructure of F1.7 and the inclusion of Table F1.7.
	Wet area	A new defined term has been included due to the restructure of F1.7 and the inclusion of Table F1.7.
Specification A1.3 Table 1	The following references have been inserted or amended:	
	AS 1038.15	The reference to the 1995 edition of AS 1038 'Coal and coke— Part 15 Higher rank coal ash and coke ash—Ash fusibility' has been deleted due to its replacement with the 2008 edition of ISO 540 'Hard coal and coke— Determination of ash fusibility'.
	AS/NZS 1170.0	Amdt 3 and 4 to AS/NZS 1170 'Structural design actions – Part 0 General principles' have been referenced.
	AS/NZS 1170.2	Reference to AS/NZS 1170 'Structural design actions – Part 2 Wind actions' has been updated to the 2011 edition. However, the 2002 edition of AS/NZS 1170.2 must be used to determine design wind speeds and wind regions and has been retained for a 12 month transition period.
	AS 1288	Amdt 2 to AS 1288 'Glass in buildings – Selection and installation' has been referenced.
	AS 1720.1	Amdt 1 and 2 to AS 1720 'Timber structures – Part 1 Design methods' have been referenced.
	AS 1926.2	Amdt 2 to AS 1926 'Swimming pool safety – Part 2 Location of safety barriers for swimming pools' has been referenced.
	AS 1926.3	Amdt 1 to AS 1926 'Swimming pool safety – Part 3 Water reticulation systems' has been referenced.
	AS 2159	Amdt 1 to AS 2159 'Piling – Design and installation' has been referenced.
	AS/NZS 2208	Reference to the 1996 edition of AS/NZS 2208 'Safety glazing materials in buildings' has been removed. The deletion is a consequence of the referencing of Amdt 2 of AS 1288.

Reference	Changes and Commentary	
	AS 2870	Reference to AS 2870 'Residential slabs and footings – Construction' has been updated to the 2011 edition. The 1996 edition of AS 2870 has been retained for a 12 month transition period, after which it will be removed.
	AS/NZS 3500.4	Amdt 2 to AS/NZS 3500 'Plumbing and drainage – Part 4 Heated water services' has been referenced.
	AS 3600	Reference to the 2001 edition of AS 3600 'Concrete structures' has been removed as a consequence of the completion of a 12 month transition period between the 2001 and 2009 editions.
	AS 3600	Amdt 1 to the 2009 edition of AS 3600 'Concrete structures' has been referenced.
	AS/NZS 3666.1	Reference to AS/NZS 3666 'Air-handling and water systems of buildings - Microbial control - Part 1 Design, installation and commissioning' has been updated to the 2011 edition.
	AS/NZS 3666.2	Reference to AS/NZS 3666 'Air-handling and water systems of buildings - Microbial control - Part 2 Operation and maintenance' has been updated to the 2011 edition.
	AS 3700	Reference to AS 3700 'Masonry structures' has been updated to the 2011 edition.
	AS 3740	Reference to AS 3740 'Waterproofing of domestic wet areas' has been updated to the 2010 edition. This edition of AS 3740 replaces the 2004 edition 'Waterproofing of wet areas within residential buildings'.
	AS 3959	Amdt 3 to AS 3959 'Construction of buildings in bushfire-prone areas' has been referenced.
	AS 4100	Amdt 1 to AS 4100 'Steel structures' has been referenced.
	AS/NZS 4600	Amdt 1 to AS/NZS 4600 'Cold-formed steel structures' has been referenced.
	ASTM C1279	Reference to the 2009 edition of ASTM C1279 'Standard Test Method for Non-Destructive Photoelastic Measurement of Edge and Surface Stresses in Annealed, Heat-Strengthened, and Fully Tempered Flat Glass' has been removed. The deletion is a consequence of the referencing of Amdt 2 of AS 1288.

Reference	Changes and Commentary	
	ARI 460	Reference to the 2000 edition of ARI 460 'Remote mechanical-draft air-cooled refrigerant condensers' has been removed as a consequence of the completion of a 12 month transition period between the 2000 edition of ARI 460 and the 2005 edition of AHRI 460.
	ARI 550/590	Reference to the 1998 edition of ARI 550/590 'Water chilling packages using the vapour compression cycle' has been removed as a consequence of the completion of a 12 month transition period between the 1998 edition of ARI 550/590 and the 2003 edition of AHRI 550/590.
	ABCB Protocol for House Energy Rating Software	Reference to the 2006 edition of the ABCB Protocol for House Energy Rating Software has been removed. The deletion is a consequence of the recognition of NatHERS as the appropriate accreditation scheme for house energy rating software.
	ABCB Protocol for Structural Software	The 2011 edition of the ABCB Protocol for Structural Software has been referenced as a consequence of its inclusion in B1.5.
	Education and Care Services National Law Act (Vic)	Reference inserted as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
	EN 14179	Reference to the 2005 edition of EN 14179 'Glass in buildings — Heat-soaked thermally-toughened soda lime silicate safety glass' has been removed. The deletion is a consequence of the referencing of Amdt 2 of AS 1288.
	ISO 540	The 2008 edition of ISO 540 'Hard coal and coke—Determination of ash fusibility' has been referenced to replace the 1995 edition of AS 1038 'Coal and coke—Part 15 Higher rank coal ash and coke ash—Ash fusibility'.
	NASH Standard Residential and low-rise steel framing, Part 1	Amdt C to NASH Standard 'Residential and low-rise steel framing – Part 1 Design criteria' has been referenced.
Section B		
B1.0	As a consequence to the inclusion on a new provision in B1.5 for structural software, sub-clause (a) and (b) have been amended to refer to B1.5.	

Reference	Changes and Commentary
B1.2	As a consequence of referencing the 2011 edition of AS/NZS 1170.2 'Structural design actions - Wind actions', B1.2 has been amended and restructured to allow the option of using the 2002 or 2011 editions of the standard, except clause 2.3 and Figure 3.1 in the 2011 edition is replaced by the same clause and figure from the 2002 edition.
B1.4(h)(iii)	As a consequence of the referencing of Amdt 2 of AS 1288 the provisions for protection from nickel sulphide breakage in glazing have been deleted.
B1.5	A new provision has been included to require that, in specified circumstances, structural software used in computer aided design of a building or structure must comply with the ABCB Protocol for Structural Software.
Specification B1.2 Scope	As a consequence of referencing the 2011 edition of AS/NZS 1170.2 'Structural design actions - Wind actions', the scope of Specification B1.2 has been amended and restructured to allow the option of using the 2002 or 2011 editions of the standard, except clause 2.3 and Figure 3.1 in the 2011 edition is replaced by the same clause and figure from the 2002 edition.
Section C	
C2.1	The application of part has been amended as a consequence of the inclusion of an exemption to C2.12(a)(v) for Class 8 electricity network substations.
C3.15(c)(i)(C)	To clarify that the combustibility of liquids or gases is not required to be determined by testing to AS 1530.1, 'combustible' is no longer used in the context of the defined term.
Specification C1.1 Clause 2.5(c)(ii)(E)	To clarify that the combustibility of liquids or gases is not required to be determined by testing to AS 1530.1, 'combustible' is no longer used in the context of the defined term. The term 'flammable' has been inserted for consistency with the terminology used in C3.15(c)(i)(C).
Specification C1.11 Clause 3(g)	A new sub-clause has been included to require that connections providing lateral support to a panel must be designed to remain engaged to the supported panel both before and during a fire.
Specification C3.15 Clause 7(a)	ISO 540 'Hard coal and coke— Determination of ash fusibility' has been referenced to replace AS 1038 'Coal and coke— Part 15 Higher rank coal ash and coke ash—Ash fusibility'.
Section D	
D1.16 (a)(ii) and (b)(iii)(A)	Class 8 electricity network substations have been added to the circumstances where a ladder may be used in lieu of a stairway.
D2.1	The application of the part has been amended to include the new handrail provisions D2.17(d) and (e).
D2.16(h)(i)(A) and (B) and (h)(ii)(A)	Clarification has been added to how openings in balustrades are to be measured.

Reference	Changes and Commentary
D2.17(d)	Due to new provisions to reduce slips trips and falls in buildings, a requirement has been included for handrails to be provided for stairs and ramps in sole-occupancy units of Class 2 or 3 buildings or a Class 4 part of a building.
D2.17(e)	New provision inserted to exempt certain handrails and situations from having to comply with D2.16(d).
Section E	
E1.3(b)(i)	New sub-clauses inserted to exempt a Class 8 electricity network substation from compliance with clause 4.2 of AS 2419.1 if the network substation cannot be connected to the town main supply and one hour water storage capacity is provided for firefighting purposes.
E1.4(a)(i)	A new sub-clause has been included to exempt a Class 8 electricity network substation from compliance with E1.4.
Table E1.5	The table has been amended to exclude from the requirement to install a sprinkler system, a Class 8 electricity network substation with a floor area not more than 200 m^2, located in a multi-classified building.
E2.1	The application of part has been amended as a consequence of the inclusion of the exemption for a Class 8 electricity network substation with a floor area not more than 200 m^2, located in a multi-classified building.
Specification E2.2a Clause 7	Sub-clause (e) has been amended to refer to Table E2.2a for large isolated buildings.
EV4.1	A new verification method has been included to verify compliance with the Performance Requirement EP4.1. EV4.1 is a means of verifying if a proposed emergency lighting system achieves the level of illumination for safe evacuation required by EP4.1 in an emergency.
Section F	
F1.7	As a consequence of referencing the 2010 edition of AS 3740 'Waterproofing of domestic wet areas', F1.7 has been amended and restructured to refer to the new Table F1.7 which contains the requirements for when a building element in a wet area is required to be either water resistant or waterproof.
Table F1.7	As a consequence of referencing the 2010 edition of AS 3740 'Waterproofing of domestic wet areas', a new Table F1.7 has been included which contains the requirements for when a building element in a wet area is required to be either water resistant or waterproof.
Figure F1.12 and Table F1.12	The climatic zones for sub-floor ventilation have been changed from 1, 2 and 3 to A, B and C to avoid confusion with the climate zones which are used for energy efficiency.

Reference	Changes and Commentary
F2.3(g)(i)	A number of amendments have occurred for facilities in a Class 9b early childhood centre as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care, including: • Requirements for child-proof latches in kitchen facilities. • Kitchen facilities in a centre which accommodates children younger than 2 years old are to be designed to enable continuous supervision.

F2.3(g)(iii)	A number of amendments have occurred for facilities in a Class 9b early childhood centre as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care, including:
	• Requirements for a bench type baby bath to be within 1 m of a nappy change bench.
	• New requirements for a nappy change bench, including:
	  • Proximity of the bench to be within 1 m of separate adult hand washing facilities.
	  • A minimum area and a height of the bench above the finished floor level.
	  • Space to accommodate the storage of steps.
	  • The position of the bench to allow supervision of the play area to occur at all times by a staff member changing a nappy .

Table F2.3	The number of pans and design occupancy for children in an early childhood centre has increased from 1 between 1 and 15 to 2 pans for a design occupancy between 1 and 30. This is a consequence of aligning Volume One with the National Quality Framework for early childhood education and care. An additional note has also been included to the table covering access to facilities from both indoor and outdoor play areas.
Table F2.3	A new note has been included to exempt a Class 8 electricity network substation from the requirement to have sanitary facilities.
F2.5(c)	A new sub-clause has been included to cover the screening of sanitary facilities in an early childhood centre.
F4.2(d)	A new sub-clause has been included to require at least 50% of windows in a children's room in a Class 9b early childhood centre to have sills located not more than 500 mm above the floor. This is a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
F4.6	The provision has been restructured to exempt a Class 8 electricity network substation from the requirement to have natural ventilation complying with required aggregate ventilation openings.
F4.7(b)	Class 8 electricity network substations have been exempted from the ventilation opening restrictions for borrowed ventilation.

Reference	Changes and Commentary
F4.11 (a) and (b)	Minimum ventilation requirements when an atmospheric contaminant monitoring system is installed in a carpark have been relocated from J5.2(b)(iii)(B)(bb) to the more appropriate location of F4.11(b) and revised to include a more practical control strategy. The existing provisions of F4.11 have been retained at F4.11(a).
Section G	
GO1(f)	A new sub-clause has been included to safeguard young children in outdoor play spaces. As a consequence of this change, a new application provision has been included to clarify that sub-clause (f) only applies to Class 9b early childhood centres. This is a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
GF1.4	A new Functional Statement has been inserted to restrict the passage of children to the outside of a play space. As a consequence of this change, a new application provision has been included to clarify that GF1.4 only applies to Class 9b early childhood centres. This is a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
GP1.5	A new Performance Requirement has been inserted to restrict the passage of children to the outside of a play space. As a consequence of this change, a new application provision has been included to clarify that GP1.5 only applies to Class 9b early childhood centres. This is a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
G1.0	The list of Deemed-to-Satisfy Provisions has been amended as a consequence of the inclusions of the new Performance Requirement GP1.5 and provision G1.3.
G1.1(b)	The Victorian variation flag has been amended from G1.1(b) to G1.1(a) to reflect the variation in the Victorian Appendix.
G1.3	A new provision has been inserted to require a barrier to be provided around an outdoor play area in a Class 9b early childhood centre. This is a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
GP5.1	The Performance Requirement for buildings constructed in bushfire prone areas has been amended as a consequence of recommendations made by the Victorian Bushfires Royal Commission.
Section J	
J0.2(a)(ii)	The reference to the 2006 edition of the ABCB Protocol for House Energy Rating Software Version has been removed. The deletion is a consequence of the recognition of NatHERS as the appropriate accreditation scheme for house energy rating software.
Table J1.3a	Climate zones 4 and 5 have been amended to align with climate zones 1, 2 and 3 for the required R-Value for roof and ceiling construction.

Reference	Changes and Commentary
Table J1.3b	The table has been expanded to include values for when the minimum R-Value of ceiling insulation required to satisfy J1.3(a) is less than R2.5.
Table J2.4c	The heat shading multiplier figure for climate zone 8 South orientation sector, where the G value is more than 100 mm but not more than 500 mm and has a P/H value of two, has been amended from 0.75 to 0.50.
J5.2(a)(vii)	The specific examples of applications described that could attain an exemption for an outdoor air economy cycle have been replaced with the generic term of 'process related applications', with the existing examples now referenced in the Guide to Volume One.
J5.2(b)(ii)	The defined term 'outdoor air' has been included in the provision for clarification.
J5.2(b)(iii)(B)	Minimum ventilation requirements when an atmospheric contaminant monitoring system is installed in a carpark have been relocated to the more appropriate location of F4.11(b) and revised to include a more practical control strategy.
J5.2(d)(iv)	A new sub-clause has been included to exempt a Class 8 electricity network substation from complying with the power for mechanical ventilation requirements of J5.2(b)(iii).
J5.3(b)(iii)	A new sub-clause has been included to exempt a Class 8 electricity network substation from complying with the time switch requirements of J5.3.
J5.5(b)(iv)	A new sub-clause has been included to exempt a Class 8 electricity network substation from the miscellaneous exhaust system requirement of J5.5(a).
J6.1	The application of part has been reinstated to exempt a Class 8 electricity network substation from compliance with J6.2, J6.3 and J6.5(a)(ii).
Table J6.2a Note 4	Note 4 to the table has been amended to clarify that a control device which is required by J6.3 is not an allowable adjustment factor under Table J6.2b.
J6.3(d)(ii)(A)	Clarification has been added that a security key card reader must register a person entering and leaving the building.
J8.1	The application of part has been amended to exempt a Class 8 electricity network substation from compliance with the requirements of Part J8.
Specification J5.4 Table 2a	Note 2 has been amended to cover applications where local clearances adjoining plant do not allow for the installation of insulation.
Australian Capital Territory	
Footnote	The Footnote listing other legislation has been updated.

Reference	Changes and Commentary
New South Wales Appendix	
NSW A1.1	The defined term 'special fire protection purpose' has been amended to incorporate changes to the State Environmental Planning Policy No 5 and No 9.
NSW Specification A1.1 NSW Table 1	Reference to NSW legislation have been updated.
NSW C1.10	A number of amendments have occurred to the variation including: • Sub-clause (b) has been amended to refer to specific materials listed in NSW Table 4 of NSW Specification C1.10. • A material in a Class 9b building used as an entertainment venue that is regulated under NSW Table 4 has been included under (c)(xiii)(A) as a material to which the exemption does not apply.
NSW J(A)1.1(b)	Sub-clause (b) has been deleted. As a consequence, amendments have been made to sub-clause (c) and the remaining sub-clauses have been renumbered.
Footnote	The Footnote listing other legislation has been updated.
Queensland Appendix	
Qld Part G5	A new Qld Part G5 has been inserted.
South Australian Appendix	
SA A1.1	The following definitions have been inserted or amended: Brush fence — As a consequence of a number of South Australian variations being included, a new defined term has been inserted. Renewable Energy Certificate — A new defined term 'Small-scale Technology Certificate' has been included as a consequence of changes to the Australian Government's Renewable Energy Target scheme and the removal of the defined term 'Renewable Energy Certificate'.
SA Table 1	The following references have been inserted or amended: SA A2.2 — Reference to SA A2.2 South Australian Minister's Specification — Structural Engineering Software Protocol has been deleted as it is no longer referenced. SA F1.7 — The South Australian Minister's Specification — Waterproofing of wet areas in buildings has been updated to the 2012 version.
SA A2.2	The South Australian variation has been deleted as a consequence of the adoption of the ABCB Protocol for Structural Software.

Reference	Changes and Commentary
SA C1.1	A new variation has been included to require separation of a Class 2 building from a Class 10b brush fence.
SA C2.15	A new variation has been included to require separation of a Class 2 building from a Class 10b brush fence.
SA F1.7	As a consequence of the amendments to F1.7, the South Australian variation has been amended.
SA F1.11	As a consequence of the amendments to F1.7, the South Australian variation has been amended.
SA G5.2	Sub-clauses (d) and (e) have been amended to align with changes from Amdt 3 of AS 3959.
SA G5.3	A number of amendments have occurred to the South Australian variation as a consequence of aligning the provisions with Amdt 3 of AS 3959. The changes include the following: • An amendment to (d) to include clarification of bushfire-resisting timber. • An amendment to (f) to remove the reference to doors. • A new variation has been included as sub-clause (g). The provision allows the use of polycarbonate roof sheeting for Class 10a buildings located within 6 m of a Class 2 and 3 building for BAL – Low, BAL – 12.5, BAL – 19 and BAL – 29 sites.
SA Table G1.5	A number of amendments have occurred to the table as a consequence of aligning the table with Amdt 3 of AS 3959.
SA J1.3(c)	A new sub-clause has been included for Class 5 to 9 buildings, in certain applications, to have an upper surface solar absorptance value for the roof material of not more than 0.4.
SA J7.5	As a consequence of changes to the Australian Government's Renewable Energy Target scheme the defined term 'Renewable Energy Certificate' has been deleted and replaced by a new defined term 'Small-scale Technology Certificate'.
Footnote	The Footnote listing other legislation has been updated.
Tasmanian Appendix	
Tas Table 1	The following references have been inserted: Child Care Act (Tas) — Reference inserted as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care. Education and Care Services National Law Act (Tas) — Reference inserted as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care. Health Services Establishment Act (Tas) — Reference inserted for the purposes of defining health services establishments at Part H109.

Reference	Changes and Commentary	
	Early Childhood Centre and School Age Care Facilities Code	The 2012 edition has been inserted as consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
	Health Services Establishment Code	The 2012 edition has been inserted for the purposes of regulating the design, construction and maintenance of the health services establishments.
	Centre Based Care Class 4 Standards	The 2011 edition inserted as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
	Centre Based Care Class 5 Standards	The 2011 edition inserted as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
Tas A1.1	The following definitions have been inserted, amended or deleted as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care:	
	Babies	definition deleted.
	Centre-based care class 1 facility	definition deleted.
	Centre-based care class 2 facility	definition deleted.
	Centre-based care class 4 facility	definition inserted.
	Centre-based care class 5 facility	definition inserted.
	Early childhood centre	definition amended.
	Infants	definition deleted.
	School age care facility	definition inserted.

Reference	Changes and Commentary
	Toddlers definition deleted.
Tas G5.4(a)(i)	The minimum pressure of Class 2 or 3 building's fire hydrants in a designated bushfire prone area has been reduced.
Tas Section H 109 Objective Limitations	The Limitation to the Objective has been amended to now refer to health services establishments.
Tas H102 O1 Limitations	The variation has been amended to clarify that the Objective does not apply to kitchens in Class 1 domestic dwellings.
Tas H102 F1 Limitations	The variation has been amended to clarify that the Functional Statement does not apply to kitchens in Class 1 domestic dwellings.
Tas H102 P1 to P12	The variation has been amended to clarify that the Performance Requirements P1 to P12 do not apply to kitchens in Class 1 domestic dwellings.
Tas Part H109	Part H109 has been renamed to reflect that the Part now refers to Health Services Establishments.
Tas H109.1	The application of the Part has been amended to reference the Health Services Establishment Act to define a health service establishment.
Tas H109.2	The variation has been amended to reference the Health Services Establishment Code for the design, construction and maintenance of health services establishments.
Tas Part H122	Part H122 has been renamed to reflect that the Part now refers to Early Childhood Centres and School Age Care Facilities.
Tas H122 O1	The variation has been amended to clarify that the Objective applies to Early Childhood Centres and School age Care Facilities.
Tas H122 F1	The variation has been amended to clarify that the Functional Statement applies to Early Childhood Centres and School age Care Facilities.
Tas H122 P1	The variation has been amended to clarify that the Performance Requirement applies to Early Childhood Centres and School Age Care Facilities.
Tas H122 P2	The variation has been amended to clarify that the Performance Requirement applies to Early Childhood Centres and School Age Care Facilities.
Tas H122 P3	The variation has been amended to clarify that the Performance Requirement applies to Early Childhood Centres and School Age Care Facilities.
Tas Part H122 Application	The application of the Objective, Functional Statement and Performance Requirements has been clarified as applying to licenced or approved Early Childhood Centres and School Age Care Facilities.
Tas H122.0	The application of the Deemed-To-Satisfy Provisions has been amended to refer to licenced or approved Early Childhood Centres and School Age Care Facilities.

Reference	Changes and Commentary
Tas H122.1	The provisions have been amended to now refer to the Early Childhood Centre and Schools Age Care Facilities Code in replacement of the deleted provisions.
Tas H122.1 to Tas H122.16	Variations deleted as a consequence of the adoption of the Early Childhood Centre and Schools Age Care Facilities Code as a Deemed-To-Satisfy Provision.
Victorian Appendix	
Vic A1.1	A number of amendments have occurred as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care, including: • The definition of 'early childhood centre' has been amended. • The definition of 'children's service' has been amended. • The definition of 'restricted children's service' has been amended.
Vic FF2.2(c) and Vic FP2.2(d)	The provisions have been amended to include reference to early childhood centres as a consequence of changes to the national provisions to align Volume One with the National Quality Framework for early childhood education and care.
Vic FP2.3	The Performance Requirement has been deleted as a consequence of changes to the national provisions to align Volume One with the National Quality Framework for early childhood education and care.
Vic F2.3(g)	The provision has been amended to include reference to early childhood centres as a consequence of changes to the national provisions to align Volume One with the National Quality Framework for early childhood education and care.
Vic F2.3(ga)	A new provision has been included to apply to a children's service as a consequence of changes to the national provisions to align Volume One with the National Quality Framework for early childhood education and care.
Vic Table F2.3	The table has been amended to align with changes to the national provisions to align Volume One with the National Quality Framework for early childhood education and care.
Vic F2.5(c)	The provisions have been amended as a consequence of changes to the national provisions to align Volume One with the National Quality Framework for early childhood education and care.
Vic F3.101(a)	The clear space requirement has been amended from 3.3 m^2 to 3.25 m^2 as a consequence of changes to the national provisions to align Volume One with the National Quality Framework for early childhood education and care.
Vic F4.1(d)	The provisions have been amended to include reference to early childhood centres as a consequence of changes to the national provisions to align Volume One with the National Quality Framework for early childhood education and care.

Reference	Changes and Commentary
Vic F4.2(d)	A new provision has been included to exclude a restricted children's service from the requirements of the national provision. This is a consequence of changes to the national provisions to align Volume One with the National Quality Framework for early childhood education and care.
Vic HP104.2 and Vic HP104.3	The two Performance Requirements have been removed as a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
Vic H104.3 and Vic H104.4	The provisions for window sill heights and outdoor play spaces have been deleted as a consequence of this now being covered by the national provisions. The inclusion into the national provisions is a consequence of aligning Volume One with the National Quality Framework for early childhood education and care.
Footnote	The Footnote listing other legislation has been updated.
History of BCA Adoption	
10.0	New provision added in order to set out the adoption date of the 2012 edition of Volume One in each State and Territory and to summarise the purpose of the changes from the 2011 edition.